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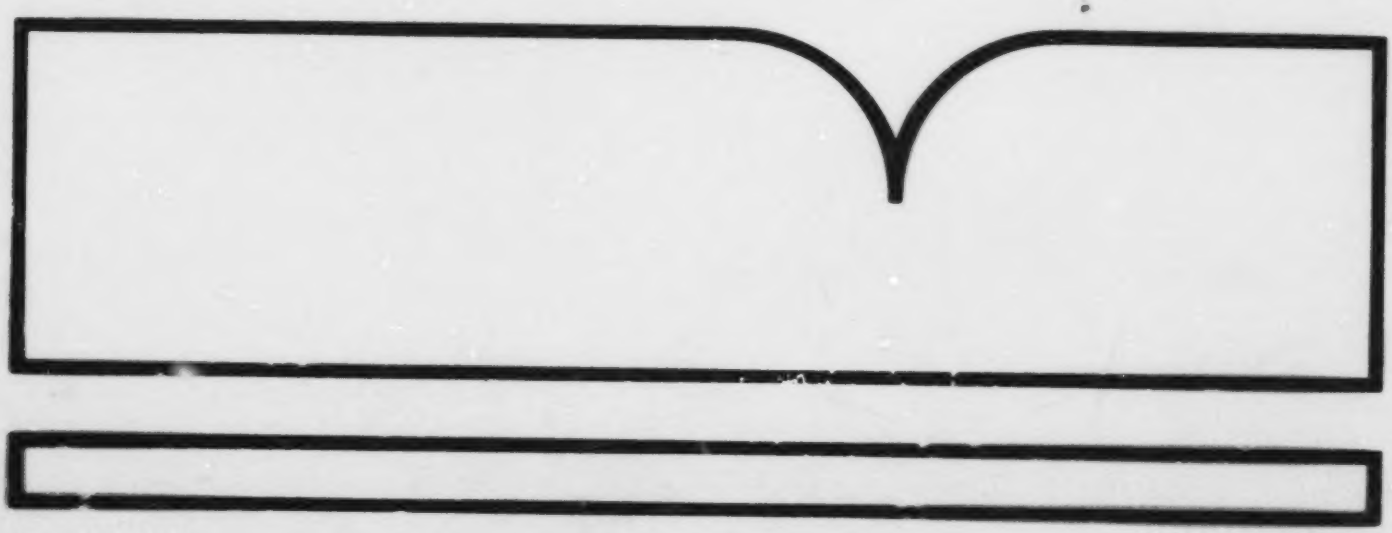
Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry Background Information for Promulgated Standards

(U.S.) Environmental Protection Agency, Research Triangle Park, NC

Jun 90



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16. ABSTRACT

Standards of performance for the control of volatile organic compound (VOC) emissions from air oxidation processes in the synthetic organic chemical manufacturing industry are being promulgated under Section 111 of the Clean Air Act. These standards will apply to VOC emissions from newly constructed, modified, and reconstructed air oxidation processes. This document summarizes the responses to public comments received on the proposed standards and the basis for changes made since proposal.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
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Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry-- Background Information for Promulgated Standards

Final EIS

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Air Oxidation Processes in Synthetic Organic Chemical Manufacturing Industry — Background Information for Promulgated Standards

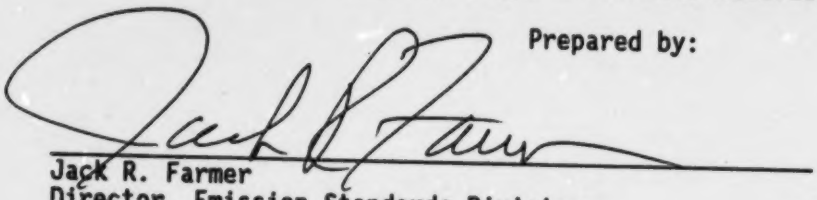
Emissions Standards Division

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711
June 1990

ENVIRONMENTAL PROTECTION AGENCY

Background Information
and Final Environmental Impact Statement
for Volatile Organic Compound Emissions from
Air Oxidation Processes in
Synthetic Organic Chemical Manufacturing

Prepared by:



6/18/90
(Date)

Jack R. Farmer
Director, Emission Standards Division
U. S. Environmental Protection Agency
Research Triangle Park, North Carolina 27711

1. The promulgated standards of performance will limit emissions of volatile organic compounds from mew, modified, and reconstructed air oxidation processes. Section 111 of the Clean Air Act (42 U. S. C. 7411), as amended, directs the Administrator to establish standards of performance for any category of new stationary source of air pollution that ". . . causes or contributes significantly to air pollution which may reasonably be anticipated to endanger public health or welfare."

2. Copies of this document have been sent to the following Federal Departments: Labor, Health and Human Services, Defense, Transportation, Agriculture, Commerce, Interior, and Energy; the National Science Foundation; State and Territorial Air Pollution Program Administrators; EPA Regional Administrators; Local Air Pollution Control Officials; Office of Management and Budget; and other interested parties.

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TABLE OF CONTENTS

		PAGE
TITLE PAGE		
DISCLAIMER		i
LIST OF TABLES		ii
1.0 SUMMARY		vi
1.1	SUMMARY OF CHANGES SINCE PROPOSAL	1-1
1.1.1	Applicability of the Standards	1-1
1.1.2	Flare Operating Specifications	1-1
1.1.3	Total Resource Effectiveness (TRE) Coefficients	1-2
1.1.4	Treatment of Compounds with Negligible Photochemical Reactivity	1-2
1.1.5	Monitoring Requirements	1-3
1.1.6	Net Heating Value Equation	1-3
1.1.7	Maximum TRE Index Value	1-4
1.2	SUMMARY OF IMPACTS OF PROMULGATED ACTION	1-4
1.2.1	Alternatives to Promulgated Action	1-5
1.2.2	Environmental Impacts of Promulgated Action	1-5
1.2.3	Energy and Economic Impacts of Promulgated Action	1-5
1.2.4	Other Considerations	1-5
1.2.4.1	Irreversible and Irretrievable Commitment of Resources	1-6
1.2.4.2	Environmental and Energy Impacts of Delayed Standards	1-6
2.0	SUMMARY OF PUBLIC COMMENTS	1-6
2.1	AFFECTED FACILITY AND APPLICABILITY OF THE STANDARDS	2-1
2.1.1	Designation of Affected Facility	2-1
2.1.2	Request to Limit Applicability of the Standards	2-1
2.1.3	Request to Exclude Manufacture of Nitrogenous Fertilizers from Ammoxidation Processes	2-10
2.2	SELECTION OF BEST DEMONSTRATED TECHNOLOGY	2-12
2.2.1	Consideration of Other Control Devices	2-12
2.2.2	Application of Technologies with Lower Cost and Energy Requirements	2-12
2.2.3	Catalytic Oxidation	2-15
		2-16

TABLE OF CONTENTS (CONTINUED)

		PAGE
2.3	MODIFICATION	
2.3.1	Provision for Increased Emissions of Pollutants Other than VOC.	2-19
2.4	ECONOMIC IMPACT.	2-19
2.4.1	Lowering Economic Feasibility Cutoff	2-19
2.4.2	Plant Data Accuracy.	2-19
2.5	COST ESTIMATION.	2-22
2.5.1	Change in Cost Procedure Base Year	2-23
2.5.2	Incinerator Cost Estimation Procedure.	2-23
2.5.3	Discrepancies in Proposal BID Cost Information.	2-24
2.5.4	Brine Disposal Costs	2-28
2.6	COST EFFECTIVENESS	2-30
2.6.1	Cost-Effectiveness Cutoff.	2-31
2.6.2	Incremental Cost and Energy Impacts of Requiring 98 Percent Control	2-31
2.7	MONITORING AND MEASUREMENT METHODS	2-36
2.7.1	Monitoring During Start-up, Shutdown, or Malfunction.	2-37
2.7.2	Request to Waive Performance Tests and Monitoring Requirements.	2-37
2.7.3	Alternative Methods of Demonstrating Compliance	2-38
2.7.4	Request to Define "Continuous"	2-40
2.7.5	Request to Consider Alternative Measurement Methods.	2-40
2.7.6	Verification of VOC Destruction Efficiency	2-41
2.7.7	Catalytic Oxidation: Location of Sampling Site and Inclusion in Regulation	2-41
2.8	EXEMPTIONS	2-42
2.8.1	Organic Pollutants with Negligible Ozone-Producing Capability	2-43
2.9	GENERAL.	2-43
2.9.1	Documentation of Contacts with OMB	2-45
		2-45

TABLE OF CONTENTS (CONCLUDED)

		PAGE
APPENDIX A:	TRE EQUATION AND COEFFICIENT DEVELOPMENT FOR THERMAL INCINERATORS.	A-1
A.1	INTRODUCTION.	A-1
A.2	INCINERATOR TRE INDEX EQUATION.	A-1
A.2.1	Incinerator TRE Index Equation Development . . .	A-1
A.2.2	Example Calculation of an Incinerator-based TRE Index Value for a Facility	A-4
APPENDIX B:	CAPITAL COST COEFFICIENTS	B-1
APPENDIX C:	FEDERAL REGISTER NOTICES OF ORGANIC COMPOUNDS DETERMINED TO HAVE NEGLIGIBLE PHOTOCHEMICAL REACTIVITY.	C-1
	INTRODUCTION.	C-1
	42 FR 35314	C-2
	42 FR 32042	C-5
	42 FR 48941	C-8

LIST OF TABLES

	TITLE	PAGE
2-1	List of Commenters on the Proposed Standards of Performance for Air Oxidation Processes in the Synthetic Organic Chemical Manufacturing Industry	2-2
A-1	Air Oxidation NSPS TRE Coefficients for Vent Streams Controlled by an Incinerator.	A-3
A-2	Maximum Vent Stream Flowrates and Net Heating Value Characteristics for Each Design Category.	A-5
B-1	Total Installed Capital Cost Equations as a Function of Offgas Flowrate	B-2

1.0 SUMMARY

On October 21, 1983, the Environmental Protection Agency (EPA) proposed standards of performance for air oxidation processes in the synthetic organic chemical manufacturing industry (SOCMI) (48 FR 48931) under the authority of Section 111 of the Clean Air Act (CAA). Public comments were requested on the proposal in the Federal Register. There were 11 commenters, most of whom consisted of industry representatives. Comments were also received from a vendor of equipment used to control emissions from air oxidation processes, and from a representative of an environmental group. On May 16, 1985, EPA reopened the period for receiving written comments on the proposed standards (50 FR 20446) to allow public comment on the results of EPA's reanalysis of the costing procedures, the total resource effectiveness (TRE) equation and coefficients, and the designation of affected facility. The reanalysis resulted from public comments on the proposed standards and the acquisition of new information collected since proposal. The comments that were submitted, along with responses to these comments, are summarized in this document. The comments and subsequent responses serve as the basis for the revisions made to the regulation between proposal and promulgation.

1.1 SUMMARY OF CHANGES SINCE PROPOSAL

Several changes and clarifications were made in the regulation as a result of the review of public comments. These changes and clarifications were made in the following areas: (a) applicability of the standards, (b) flare operating specifications, (c) TRE coefficients, (d) treatment of compounds with negligible photochemical reactivity, (e) monitoring requirements, (f) net heating value equation, (g) maximum TRE index value, and (h) miscellaneous changes.

1.1.1 Applicability of the Standards

In order to clarify the applicability of the standards, a list of chemicals has been added to the regulation. This list is contained in Section 60.617, Chemicals Affected by Subpart III. The list consists of the 36 chemicals which were identified in the background information document

(BID) as being entirely or partially produced by air oxidation processes. To accommodate this change, Section 60.610(a) of the regulation has been amended to read as follows: "The provisions of this subpart apply to each affected facility...that produces any of the chemicals listed in Section 60.617...."

1.1.2 Flare Operating Specifications

Operating specifications for flares used to comply with requirements in new source performance standards (NSPS) have been added to Section 60.18 of the General Provisions (51 FR 2701, January 21, 1986) since proposal of the air oxidation SOCMI NSPS. Therefore, the regulation has been revised to refer all owners or operators of affected facilities which use flares to comply with this NSPS to the requirements in that section.

1.1.3 TRE Coefficients

Table 1 of the regulation presents the coefficients associated with the TRE index equation. Some of the coefficients in this table were corrected to predict more accurately the TRE indexes (and associated cost-effectiveness values) of facilities. The modifications to the coefficients in Table 1 resulted from changes in the costing procedures on which these coefficients are based. The changes in costing procedures and TRE coefficients are discussed in the Agency's notice on reopening the public comment period for the proposed air oxidation standards (50 FR 20446).

Several modifications were also made in the format of Table 1 to provide clarity to owners or operators of air oxidation facilities. These modifications included: (a) the designation of Category A1 and A2 streams was changed from "chlorinated" to "halogenated"; (b) the designation for flow rate was changed from "W" to Q_s" so that the symbol would match the symbol in the EPA Reference Methods discussion; (c) the term representing flow rate intervals for selecting TRE coefficients was changed from "design standard flow rate" to "vent stream flow rate" to indicate that actual operating flow rate should be used in selecting TRE coefficients; (d) the first flow rate interval was deleted because for all vent streams with flow rates below the minimum incinerator size (500 scfm) [14.2 scm/min], a flow rate of 500 scfm

(14.2 scm/min) is used for the purposes of calculating capital and annual operating costs; and (e) the term representing flow rate for Category E streams was changed from "design standard flow rate" to "dilution flow rate = $(Q_s)(H_T)/3.6$" to indicate that dilution flow rate should be used in selection of TRE coefficients.

1.1.4 Treatment of Compounds with Negligible Photochemical Reactivity

Several changes have been made in the regulation to allow facilities to subtract compounds with negligible photochemical reactivity in determining a TRE index value. The Agency believes that it is appropriate to exclude those compounds in the regulation since they do not contribute appreciably to the formation of ozone.

To allow for subtraction of compounds with negligible photochemical reactivity in determining a TRE index, the Agency has amended the definition of total organic compounds (TOC's) in the regulation. The definition of TOC in Section 60.611 has been amended to indicate that the definitin of "TOC" means TOC less all compounds that have been determined by the Administrator to possess negligible photochemical reactivity. This definition is used only when applied to Sections 60.614(d)(2)(i), measuring molar composition; 60.614(d)(5), the hourly emission rate (E_{TOC}); 60.614(e)(1) and (e)(2), the TRE index calculation; and 60.615(b)(4) and 60.615(g)(4), the calculation of absorber, condenser, or carbon adsorber TOC vent stream concentration. For all other quantifications of TOC under these standards, VOC equals TOC less methane and ethane as defined in Section 60.614. The Federal Register citations for the list of negligibly photochemically reactive compounds that may be subtracted are presented in Appendix C and have also been added to the definition of TOC in Section 60.611 of the regulation.

1.1.5 Monitoring Requirements

The "continuous recording" requirements have been changed. All measurements such as firebox temperature, absorber liquid specific gravity, carbon adsorber steam mass flow rate and other methods for demonstrating compliance with the standards are now required to be taken at least every

15 minutes. There are several advantages to this change in monitoring requirements: (1) computer-assisted monitors are allowed, (2) the parameter measurement frequencies required for monitoring and continuous recording are consistent with the frequencies required for compliance testing, and (3) the same equipment may be used for both monitoring and compliance testing.

1.1.6 Net Heating Value Equation

To be sure that the net heating value is calculated on a wet basis, the definition of symbol "C_i" in Section 60.614(c)(4) was amended to include "on a wet basis." The net heating value must be calculated on a wet basis because the entire vent stream, including water vapor, would be combusted, and therefore this is the heating value used in calculating a TRE value.

The reference method for determining the concentration of carbon monoxide in the vent stream was changed from the EPA Reference Method 10 to ASTM D1946-82. Section 60.614(d)(2)(ii) has been amended accordingly.

1.1.7 Maximum TRE Index Value

Several changes were made in the regulation to provide for inclusion of a maximum TRE index value. The maximum TRE index value of 4.0 represents the value above which monitoring and recordkeeping requirements would not be imposed on a facility attempting to comply with the standards. It is the judgement of the Agency that facilities with TRE index values above the maximum could not lower the TRE index value below the cutoff without making a process change. Thus, the Agency believes that the monitoring and recordkeeping burden should not be imposed on such facilities. However, if a process change occurs, the facility should recalculate the TRE index value as required in Section 60.614(e). If the recalculated TRE index value is less than or equal to 1.0, the owner or operator shall notify the Administrator within 1 week of the recalculation and shall conduct a performance test according to the methods and procedures required by Section 60.614 to determine compliance with Section 60.612(a). If the recalculated TRE index value is less than or equal to 4.0, but greater than 1.0, the owner or operator shall conduct a performance test according to the methods and

procedures required by Section 60.614 and shall comply with Sections 60.613, 60.614, and 60.615. Sections 60.610, 60.614, and 60.615 of the regulation have been amended to incorporate the requirements associated with the maximum TRE index value. If the TRE index value remains above 4.0, the owner or operator need only keep a record of the recalculation.

1.2 SUMMARY OF IMPACTS OF PROMULGATED ACTION

1.2.1 Alternatives to Promulgated Action

The regulatory alternatives are discussed in Chapter 6 of the proposal BID. These regulatory alternatives reflect the different estimated percentages of facilities required to reduce emissions by 98 weight-percent or to 20 parts per million by volume (ppmv) under a particular cost-effectiveness cutoff. These regulatory alternatives were used in selection of the best demonstrated technology (BDT), considering the estimated cost impacts, nonair quality health impacts, environmental impacts, and economic impacts associated with each alternative. These alternatives have not been changed.

1.2.2 Environmental Impacts of Promulgated Action

The changes in the regulation described above will have a minor effect on the estimated air quality impacts attributed to the standards as originally proposed. The new estimated air quality impacts of the standards are presented in the Agency's notice reopening the public comment period for the proposed air oxidation standards (50 FR 20446). The changes in the regulation will have a negligible impact on the water quality and solid waste impacts attributed to the standards as originally proposed. These impacts are described in Chapter 7 of the proposal BID. That analysis of environmental impacts along with the new air quality impacts presented at 50 FR 20446 now constitute the final Environmental Impact Statement for the promulgated standards.

1.2.3 Energy and Economic Impacts of Promulgated Action

Section 7.4 of the proposal BID describes the energy impacts and Chapter 9 describes the economic impacts of the proposed standards. The

changes in the regulation described above will have a negligible effect on these impacts.

1.2.4 Other Considerations

1.2.4.1 Irreversible and Irretrievable Commitment of Resources. Chapter 7 of the proposal BID concludes that other than fuels required for the operation of volatile organic compounds (VOC's) control equipment, there is no apparent irreversible or irretrievable commitment of resources associated with the standards. The use of the TRE concept encourages the use of recovery techniques or process changes to recover pollutants as products. The control of VOC emissions using recovery techniques or process changes might be an alternative to adding combustion controls for some air oxidation facilities. This would result in the conservation of both chemicals and fuels. The changes in the regulation described above will have no impact on the commitment of resources.

1.2.4.2 Environmental and Energy Impacts of Delayed Standards. Table 1-1 in the proposal BID summarizes the estimated environmental and energy impacts associated with promulgation of the standards. If the standards were delayed, adverse impacts on air quality could result. A delay in promulgation would mean that affected facilities would be controlled to the level specified in the appropriate State implementation plan (SIP). Emission levels would consequently be higher than would be the case were the standards in effect.

2.0 SUMMARY OF PUBLIC COMMENTS

A total of 12 letters commenting on the proposed standards were received. In addition, one speaker appeared at the public hearing to comment on the proposed standards. The transcript from the public hearing, comments on the proposed standards made at the public hearing, and the 12 letters commenting on the proposed standards have been recorded and placed in the docket. The list of commenters, their affiliation, and the EPA docket item number for each of the comments are shown in Table 2-1. The docket reference is indicated in parentheses in each comment. Unless otherwise noted, all docket references are part of Docket Number A-81-22, Category IV. The comments have been organized into the following nine categories:

2.1 Affected Facility and Applicability of the Standards
2.2 Selection of BDT
2.3 Modification
2.4 Economic Impact
2.5 Cost Estimation
2.6 Cost Effectiveness
2.7 Monitoring and Measurement Methods
2.8 Exemptions
2.9 General

2.1 AFFECTED FACILITY AND APPLICABILITY OF THE STANDARDS

2.1.1 COMMENT: One commenter (D-6, D-6a) stated that the definition of affected facility contained in the proposed regulation does not conform with the requirements of the CAA insofar as it allows two or more air oxidation reactors which are joined to a common product recovery system to be interpreted as one affected facility. As an example, the commenter pointed out that if an existing facility consists of a single reactor, any changes in

TABLE 2-1

List of Commenters on the Proposed Standards of Performance for Air Oxidation Processes in the Synthetic Organic Chemical Manufacturing Industry

Docket Number A-81-22, IV

Public Hearing

Commenter	Docket Reference
Mr. A. W. Byer Process Engineering Consultant Union Carbide Corporation Post Office Box 8361 South Charleston, West Virginia 25303	F-1

Letters

Mr. H. Neal Troy Manager, Environmental Control Owens-Illinois, Incorporated One SeaGate Toledo, Ohio 43666	D-1
Mr. A. H. Nickolaus Chairman, CTG Subcommittee Air Conservation Committee Texas Chemical Council 1000 Brazos, Suite 200 Austin, Texas 78701	D-2
Mr. D. C. Macauley Environmental Affairs Manager Union Carbide Corporation Post Office Box 8361 South Charleston, West Virginia 25303	D-3
Mr. William T. McShea, Manager, TORVEX Environmental Products Engelhard Industries Division 2555 U.S. Route 22 Union, New Jersey 07083	D-4
Mr. Mark Urbassik Manager, Environmental Regulatory Programs Koppers Company, Inc. Pittsburgh, Pennsylvania 15219	D-5

Commenter	Docket Reference
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Geraldine V. Cox, Ph.D. Vice President Technical Director Chemical Manufacturers Association 2501 M Street, N.W. Washington, D.C. 20037	D-7
Mr. Gary D. Myers President The Fertilizer Institute 1015 18th Street, N.W. Washington, D.C. 20036	D-8
Mr. A. G. Smith Manager, Environmental Affairs Shell Chemical Company One Shell Plaza Post Office Box 2463 Houston, Texas 77001	D-9
Mr. J. D. Reed General Manager Environmental Affairs and Safety Standard Oil Company (Indiana) 200 East Randolph Drive Chicago, Illinois 60601	D-10
Mr. Keith M. Bentley Senior Environmental Engineer Georgia-Pacific Corporation 133 Peachtree Street, N.E. Post Office Box 105605 Atlanta, Georgia 30348	D-11

Commenter	Docket Reference
Mr. R. F. Kelley Assistant Corporate Director Environmental Affairs Union Carbide Corporation Old Ridgebury Road Danbury, Connecticut 06817	D-12
Mr. D. C. Macauley Environmental Affairs Manager Union Carbide Corporation Post Office Box 8361 South Charleston, West Virginia 25303	D-13
Geraldine V. Cox, Ph.D. Vice President Technical Director Chemical Manufacturers Association 2501 M Street, N.W. Washington, D.C. 20037	D-14

that reactor during a 2-year period which result in cumulative costs of over 50 percent of the capital cost of a new reactor would make that reactor an affected facility. However, if two or more reactors are joined in an existing facility, similar changes to one reactor may not make that facility subject to the standards because the capital costs are not likely to exceed 50 percent of the capital cost of the entire facility (i.e., single reactor plus combined reactors). Thus, allowing two or more reactors to be joined in the same affected facility would cause more emissions from air oxidation reactors to go uncontrolled than would be the case were each reactor treated as a separate affected facility.

According to the commenter, this broad definition of affected facility in effect legislates a mechanism by which certain facilities may avoid the standards. The commenter stated that the broad definition is not consistent with the holding in ASARCO v. EPA, 578 F.2d 319 (D.C. Cir. 1978), which held that the Agency could not define affected facility in a way which would allow major units of production to go unregulated under the new source performance standards (NSPS) without offering justification for the differential treatment of identical sources. In this instance, the commenter concluded, the Agency has offered no justification for holding reactors to different standards depending on whether they are or are not joined to a common product recovery system.

The commenter offered several suggestions for rectifying the definition. First, the commenter recommended that all reactors be defined as affected facilities. Alternatively, the commenter suggested that for cases where several reactors are joined to a common product recovery device the NSPS require a partial reduction in the total VOC emissions from the group of reactors. The partial reduction should be equivalent to the reduction that would be required in the emissions from the single new reactor were it the only one connected to the product recovery system. A third suggestion recommended by the commenter is that the Agency lengthen the period of time over which capital investments will be accumulated in order to determine whether a reconstruction has occurred.

RESPONSE: As the commenter suggests, EPA's definition of the "affected facility" in NSPS must be consistent with the definition of the term "stationary source" in Section 111 of the CAA, as interpreted by the U. S. Court of Appeals of the D.C. Circuit in ASARCO v. EPA, 578 F.2d 319 (1978). As the commenter notes, the Court in ASARCO discussed the scope of EPA's discretion in choosing the affected facility. The Court stated:

> The EPA's definition of a "facility", which this court accepts, is "any apparatus to which a standard of performance is specifically applicable." [Citation omitted.] This definition is clearly designed to designate as "facilities" those units of equipment -- be they individual machines, combinations of machines, or even entire plants -- that the Agency finds to be appropriate units for separate emission standards. A cursory review of EPA's regulations indicates that the units designated as "facilities" under this definition are usually larger than individual machines or single pieces of equipment, and are sometimes whole plants. [Citation omitted.] In designating what will constitute a facility in each particular industrial context, EPA is guided by a reasoned application of the terms of the statute it is charged to enforce, not by an abstract "dictionary" definition. This court would not remove this appropriate exercise of the Agency's discretion. [Citations omitted.] 578 F.2d at 324 n. 17.

Consistent with this statement, EPA has selected the affected facility in the air oxidation standards by looking at the terms and purposes of Section 111, as well as the characteristics of air oxidation plants. As EPA stated at proposal, the main purpose of Section 111 is to minimize emissions by requiring the application of BDT at all new, modified, and reconstructed sources (considering cost, nonair quality health and environmental effects, and energy impacts). The EPA believes that in most cases a narrow affected facility designation will best further this purpose, because in most cases a narrow designation ensures that all new emission units will be brought under the coverage of the standards. If, for example, an entire plant is designated as the affected facility, no part of the plant would be covered by the standards unless the replacement caused the plant as a whole to be "modified" or "reconstructed." If each piece of equipment is designated as a separate affected facility, then as each piece is replaced, the replacement piece would be a new source subject to the standards. For this reason, EPA uses a presumption that the narrow designation is appropriate.

The EPA treats the narrow designation only as a presumption, however, because in some cases a broader affected facility may be more consistent with the purposes of Section 111. For example, the Agency might choose a broader designation if it concluded that either: (a) it would result in greater emissions reduction than would a narrow designation; or (b) the other relevant statutory factors (technical feasibility, economic, cost, energy, and nonair quality health and environmental impacts) point to a broader designation.

The EPA analyzed several alternative affected facility definitions for the air oxidation standards, including: (1) each individual reactor with its recovery system, (2) the group of reactors whose streams are ducted together through a single recovery system, and (3) the entire plant. Using the presumption mentioned above, EPA defined as a single affected facility each reactor whose stream is sent to its own recovery system. The EPA concluded, however, that when reactor streams are joined and sent through a single recovery system the group reactors and their recovery system, rather than each reactor, should be a single affected facility.

The EPA estimates a greater reduction in national VOC emissions using the broader designation of affected facility. Greater reduction in emissions will occur with the broader designation because for facilities where the TRE index is less than 1.0, emissions from existing air oxidation reactors will also be controlled when new reactors are combined with existing reactors sharing a common recovery system. Under a narrow designation, when a new reactor is combined with existing reactors, the new reactor is treated separately. Thus, only emissions from the new reactor could potentially be controlled.

The commenter did not comment on this reasoning. Instead the commenter contended that when more than one reactor is vented to the same recovery device EPA's designation will permit reactor replacements to avoid coverage under the standards and will therefore result in less emission reduction than would occur if the commenter's affected facility designation were used. The EPA disagrees with the commenter's analysis and conclusion. The replacement of air oxidation reactors or pieces of recovery equipment is rare within the

industry. This is because reactors are expensive pieces of equipment which are designed to last a long time. Moreover, the Agency has concluded that those few replacements which do occur often result from process changes (e.g., from chlorination to hydrochlorination) or catastrophic events that would probably require replacement of most of the group of reactors joined to a single recovery system. These changes would likely amount to a "reconstruction" of the facility as it is defined in these standards. Thus, in the small percentage of cases where reactor replacements occur, the facility would most likely fall under the coverage of the standards.

Furthermore, as EPA stated at proposal, the other types of reactor changes that source owners would most likely consider are substantial changes in catalysts, reactor conditions, or product separation purification equipment. The cost of these changes is so great, however, that most owners would choose to build new groups of reactors rather than radically modify individual existing reactors. Thus, few air oxidation reactors would undergo process changes that would subject them to the standards under either the commenter's or EPA's designation. Moreover, under EPA's designation, in the event an owner added a reactor to an existing group of reactors ducted to the same recovery system, it is unlikely the facility could avoid being considered a modification by offsetting the new reactor emissions somewhere else within the reactor group. This is because it would likely be technologically infeasible to reduce emissions sufficiently or at all from the other reactors. Although some VOC reductions could occur through upgrading recovery equipment, it is unlikely that this reduction would result in a full offset of the new reactor emissions because the increased load on the recovery device (i.e., increased flow and VOC) would make the needed increase in VOC removal efficiency difficult to achieve. Thus, the likely result is that addition of a reactor to a group of joined reactors would bring the entire set under the coverage of the standards as a modified facility.

In short, the broad evasion of the modification and reconstruction provisions that might generally occur under broad affected facility designations would not occur under EPA's designation for the air oxidation standards. As discussed above, under EPA's designation, the inability of

owners or operators to offset emissions from new reactors added to a set of existing reactors would likely cause the entire set of new and existing reactors to come under the standards as a modified facility. This results in a greater emission reduction potential than would be the case for these reactors under a narrow designation. For these reasons, EPA disagrees with the commenter's premise that the affected facility designation in these standards would result in foregone emission reductions and would therefore be inconsistent with Section 111. Rather, EPA's selection of the affected facility represents a reasoned application of Section 111, consistent with ASARCO, because it couples consideration of both the need to secure the greatest emissions reductions from new and modified emission units with the technological realities of the air oxidation process.

A second reason for selecting the broader designation of affected facility is that it facilitates implementation of the standards. When several reactors feed process vent streams into a common recovery system, the characteristics of the emissions vented into the atmosphere from the recovery system are determined by both the process vent streams from each of the reactors and the efficiency of the recovery system. Determining accurately the contribution of each individual reactor to these emissions (i.e., each reactor's TRE index value) can be complex and, therefore, costly. It requires a mass balance calculation using three sampling sites: two which are located upstream and downstream of the recovery system and one located just downstream of the reactor.

Under the broader designation EPA is promulgating, however, only one sampling site located after the last recovery device is needed to yield an accurate determination of the facility's TRE index value. No estimation of the recovery device efficiency on individual reactors is required because the standards cover the entire vent stream. Therefore, there is no need to determine which portion of the final vent stream from a group of reactors is attributable to new, modified, and reconstructed reactors and which portion is attributable to reactors that have not been changed or added. This results in a decrease in both the cost and complexity of performance testing because fewer sampling sites and a simpler analysis are needed.

Finally, the Supreme Court recently upheld EPA's similar interpretation of the same term, "stationary source", in a similar context. Chevron, U. S. A., Inc. v. NRDC, 467 U. S. 837, 104 S.Ct. 2778 (1984). In that case, EPA had defined the term as an entire plant for the purpose of implementing the Section 173 new source permit requirements. The Court deferred to the Agency's interpretation because Congress had not indicated how it would define the term and EPA's construction was rational in light of the purposes of the new source review program.

In reaching the first conclusion, the Court noted that Congress has defined "stationary source" in Section 111 as "any building, structure, facility, or installation" that emits air pollution. The Court found this definition unclear, however, and held:

> To the extent any Congressional "intent" can be discerned from this language, it would appear that the listing of overlapping, illustrative terms, was intended to enlarge, rather than confine, the scope of the Agency's power to regulate particular sources in order to effectuate the policies of the Act.

Id. at 2791. Thus, Chevron supports the view that Congress left EPA significant discretion to interpret the definition of "stationary source" for purposes of implementing Section 111, so long as the Agency's interpretation is reasonable in light of the statute's purposes. The EPA has exercised this discretion by defining the "affected facility" in the air oxidation NSPS as a collection of equipment that is smaller than an entire plant but larger than each individual reactor. As indicated above, that definition reflects consideration of the complexity of reactor-specific emission measurement, as well as the degree of emission reduction that would result under the available alternative definitions -- two factors centrally relevant to the purposes of Section 111. In light of Chevron, EPA feels that this represents a reasonable exercise of its discretion in interpreting the statute.

2.1.2 COMMENT: Three commenters (D-7, D-10, and D-11) requested clarification on the applicability of the standards. One commenter (D-11) stated that the definition of affected facility contained in the proposed

regulation does not specifically limit the applicability of the standards to air oxidation processes in the SOCMI. Consequently, the proposed standards could be interpreted as also applying to air oxidation reactors in other industries such as asphalt roofing and kraft pulp mills. Three commenters (D-7, D-10, and D-11) recommended that the applicability provisions of the proposed regulation be amended to specify that the standards are applicable only to air oxidation processes which are used in the manufacture of certain listed chemicals. Two of the commenters (D-7 and D-10) specifically recommended that this list include those which were included in the standards for fugitive emissions from the SOCMI at 40 CFR 60.489. The third commenter (D-11) recommended that the 36 chemicals which were evaluated in the BID for air oxidation processes be incorporated into the proposed standards.

RESPONSE: In order to clarify the applicability of the standards, several changes have been made in the regulation. The Agency has amended Section 60.610(a) of the regulation to read as follows: "The provisions of this subpart apply to each affected facility...that produces any of the chemicals listed in Section 60.617...." A list of affected chemicals has also been added to Section 60.617. The Agency believes that this list will clarify the applicability of the standards. The list consists of the 36 chemicals which were identified in the BID as being entirely or partially produced ny air oxidation processes. The list included in the standards for fugitive emissions from SOCMI facilities includes many chemicals which are not produced by air oxidation and thus is not appropriate for the air oxidation standards.

To the Agency's knowledge, none of the listed chemicals are produced at asphalt roofing plants and kraft pulp mills using air oxidation processes. Thus, air oxidation processes at asphalt roofing and kraft pulp mills would not be covered by these standards. If any of the listed chemicals were produced as intermediates or final products at asphalt roofing plants or kraft pulp mills, the facility producing the listed chemical would be covered by the standards.

2.1.3 COMMENT: One commenter (D-8) stated that it should be made clear that the provisions which specify that the standards apply to ammoxidation processes refer to the production of synthetic organic chemicals such as acrylonitrile, and not to processes for the manufacture of nitrogenous fertilizers.

RESPONSE: As stated in the response to comments 2.1.2, applicability of the standards is limited specifically to air oxidation processes (including ammoxidation and oxychlorination) within the SOCMI. Only those chemicals listed in Section 60.617 are subject to the proposed standards. This list does not include any nitrogenous fertilizers. However, if any of the listed chemicals were produced as intermediates or final products at a fertilizer plant using an air oxidation process, the facility at that plant would be covered by the standards.

2.2 SELECTION OF BDT

2.2.1 COMMENT: Three commenters (D-2, D-4, and D-7) indicated that the selection of BDT was too restrictive in not allowing the use of other control devices. One commenter (D-2) stated that catalytic oxidizers, boilers, process heaters, and flares should be allowed as alternate combustion technologies. Another commenter (D-7) indicated that all of these technologies have VOC destruction efficiencies comparable to those of thermal incinerators. This commenter indicated that catalytic oxidation and flaring could be more cost effective than thermal incineration for an individual plant. Furthermore, the commenter stated that the regulation should allow the use of other available technologies (e.g., membranes, wet air oxidation) that achieve control efficiencies which are less than the 98 percent combustion requirement, but which may be greater than those needed to meet the TRE cutoff of 1.0. A third commenter (D-4) indicated that catalytic oxidation is widely used within the industry and can be an attractive alternative to thermal incineration.

Three commenters (D-2, D-4, and D-7) stated that in analyzing regulatory alternatives inadequate consideration was given to control technologies other

than thermal incineration. The commenters believe that the combustion devices listed above should also have been analyzed.

RESPONSE: The regulation does not prohibit the use of any control device that reduces VOC emissions by 98 weight-percent or to 20 ppmv (whichever is less stringent). These emissions reduction requirements represent the capabilities of thermal oxidation which the Agency believes is BDT. Based upon available data, the Agency believes that those combustion devices mentioned by the commenters are capable of achieving 98 percent VOC destruction efficiency in cases where they are applicable. Therefore, the standards do allow the use of alternative control techniques, such as boilers, process heaters, flares, and catalytic oxidizers, as long as the owner or operator of a facility using one of these devices can demonstrate that the emission reduction requirements and/or limits are achieved. The control techniques (i.e., membranes, wet air oxidation) identified by the commenter that do not achieve 98 weight-percent VOC reduction or 20 ppmv outlet concentration are not allowed. If these techniques were found to be capable of achieving these emission reduction requirements they would be allowed. Under such circumstances, the owner or operator of an affected facility using these devices would be required to demonstrate compliance as indicated in Section 60.613(e). The owner or operator would also have to provide information describing the operation of the control device and the process parameter(s) which would indicate proper operation and maintenance of the control device.

Several commenters were concerned that the Agency did not adequately consider alternative control techniques in analyzing regulatory alternatives. In order to analyze the impacts of this regulation upon all segments of the industry, EPA first attempted to identify a technology or technologies that would be available to all potentially affected SOCMI air oxidation facilities. Thermal oxidation was the technology that best met this qualification for the industry as a whole. Consequently, EPA focused on thermal oxidation for the purposes of the impacts analysis. Thermal oxidation is an expensive VOC control technique relative to other available

control techniques. The use of thermal oxidation in the TRE equation prevents an underestimation of the costs that may be incurred by facilities since no facility will use a more expensive device and, in fact, some facilities will use less expensive devices such as flares, boilers, process heaters, and catalytic oxidizers. However, for these other control techniques EPA was unable to identify any subcategory of air oxidation vent streams where these devices would always be applicable.

The other available VOC control techniques (i.e., catalytic oxidizers, boilers, process heaters, and flares) were examined, but were not included in the impacts analysis for various reasons. Although catalytic oxidizers are capable of achieving 98 percent destruction efficiency, some air oxidation vent streams may have characteristics which would limit the applicability of catalytic oxidizers. For example, vent streams with high heating values or vent streams with compounds that may deactivate the catalyst may not be suitable for applying catalytic oxidizers. Catalysts can be deactivated by compounds sometimes present in the waste stream, such as sulfur, bismuth, phosphorus, arsenic, antimony, mercury, lead, zinc, or tin. Deactivation of the catalyst may also occur at high temperatures. Because of these susceptibilities to individual waste stream characteristics, catalytic oxidation has not been demonstrated to be universally applicable for VOC emissions reduction from all air oxidation processes. The VOC destruction efficiencies may vary among processes and among plants. Although catalytic oxidation was not included in the impacts analysis, in many cases this device may be able to meet the 98 percent VOC reduction requirement as stated above. However, the Agency is unable with available information to identify subcategories of air oxidation processes for which these technologies would always apply.

Other combustion devices, such as boilers, process heaters, and flares were also examined and found not to be universally applicable. However, in many cases, these devices can achieve 98 percent VOC reduction under various operating conditions and thus are permitted as control devices subject to a compliance demonstration (except for boilers greater than 44 MW (150 million Btu/hr)), which are exempted from the compliance demonstration

requirement). The Agency, however, cannot identify those specific facilities for which these technologies can always be used, and therefore, they cannot form the basis for analysis of industry-wide impacts. Flares were not considered before proposal because they are generally not used to control air oxidation emissions in the SOCMI. Low heat content offgas streams such as those found in air oxidation processes are typically not combusted in flares before a substantial amount of supplemental fuel would be required to increase the offgas heat content. However, the Agency does not intend to exclude the use of flares. To facilitate their use, the Agency has added operating specifications, monitoring requirements, test methods, and a TRE equation to the regulation for flares to provide guidance to those owners or operators of an affected facility planning to comply with the standards by using a flare.

2.2.2 COMMENT: One commenter (D-6, D-6a) recommended that technologies which involve lower costs and energy requirements than thermal incineration be evaluated for application to reactors for which thermal incineration has been determined to have too high a cost per ton of VOC destroyed. Specifically, the commenter pointed to product recovery devices, such as carbon adsorption, or other devices such as catalytic oxidation as technologies which should be examined further by the Agency for application to sources which are currently exempted from the thermal incineration requirement of the proposed regulation.

RESPONSE: Catalytic oxidizers and product/by-product recovery devices (e.g., adsorbers, absorbers, and condensers) were examined but were not considered as alternative BDT for facilities with a TRE index above 1.0. The reason they were not considered is that the Agency was unable to identify subcategories for which these devices would always apply. Section 11 of the CAA requires the Agency to demonstrate that a technology is applicable in all representative conditions. In the National Lime Association v. EPA, 627 F.2d 416 (D. C. Cir, 1980), the Court held that the Agency must account for the factors that may contribute to the efficiency of the emission control system or to the amount of emissions that would be discharged from the

emission control system. The Agency recognizes that in some cases it may be appropriate to develop subcategories for which different types or levels of control would apply. However, in the case of the air oxidation NSPS this is not feasible.

The performance of catalytic oxidizers is sensitive to many air oxidation process vent stream characteristics such as those described in the response to comment 2.2.1. The performance of product/by-product recovery devices may be greatly affected by the vent stream flow rate, water content, temperature, VOC concentration, and VOC properties such as solubility, molecular weight, and liquid/vapor equilibrium. Since these characteristics vary widely within the industry, it is not possible with available information and resources to identify subcategories of air oxidation processes for which these devices would always be applicable and to specify control efficiencies under an industry-wide standard approach. Even with greater resources, this approach would be infeasible because it would require a stream-by-stream characterization, ultimately resulting in the need for a separate standard for each individual air oxidation process used to produce a listed chemical. The number of standards required to regulate the same number of sources would increase significantly. The Agency feels that such an approach to regulating the air oxidation industry would be administratively infeasible and therefore environmentally counterproductive. In any event, as the commenter recognizes, proceeding now with this generic regulation based on thermal incineration at least represents an important first step in regulating air oxidation emissions and does not preclude later regulation of subcategories of air oxidation facilities should that become feasible. The EPA believes it has the authority to take this step-by-step approach under Section 111. See, e.g., Group Against Smog and Pollution v. EPA, 665 F.2d 1284 (D. C. Cir. 1981).

2.2.3 COMMENT: Two commenters (D-3 and D-4) implied that the emission reduction required in the regulation should be lowered to make provision for catalytic oxidation as a resource-effective control method. One commenter (D-3) indicated that catalytic oxidation could achieve a VOC destruction

efficiency close to that of thermal incineration at a lower cost effectiveness. However, the commenter indicated that to achieve 98 percent emissions reduction his firm would have to install a thermal incinerator after the catalytic oxidizer.

Another commenter (D-4) indicated that although catalytic oxidation can be designed for VOC destruction efficiencies higher than 99.9 percent (i.e., comparable to efficiencies for thermal incineration), economic factors dictate whether these levels are practical. The commenter added that the 98 percent destruction efficiencies associated with the proposed standards would possibly require the use of uneconomically large catalyst volumes in catalytic incinerators or the use of thermal incinerators. The commenter pointed out that neither of these options may result in a measurable improvement in the environment over the case of catalytic oxidation at an efficiency slightly lower than 98 percent. Furthermore, the use of thermal incineration instead of catalytic oxidation may possibly entail the following detrimental effects: (a) higher energy usage by the affected plants, (b) an increase in NO_x emissions from the affected plants using thermal incineration, and (c) a decrease in the competitive position of domestic chemical producers with respect to foreign competition.

RESPONSE: The Agency has decided to make no changes in the emission reduction requirements of the standards. The standards require facilities to achieve an emission reduction that reflects the capabilities of BDT, which for certain facilities is reduction of VOC emissions by 98 weight-percent or to 20 ppmv through incineration. The standards do not prohibit the application of any devices, including catalytic oxidizers, which are used to comply with the emission reduction requirements and/or emission limits. The Agency believes, based upon available data, that catalytic oxidizers are capable of achieving 98 percent destruction efficiency in all cases where they are applicable. Since both types of units can meet the 98 weight-percent reduction or 20 ppmv limit, the owner or operator would have the flexibility to choose the device which he believes is best for the facility in terms of cost or other technical considerations.

Catalytic oxidizers do not, however, necessarily have the advantages over thermal incinerators named by the commenters. Because of the potential for greater heat recovery associated with recuperative heat exchangers used in conjunction with thermal incinerators, thermal incinerators may in many cases be less expensive and use less energy than catalytic oxidation units. This has to be examined on a case-by-case basis by owners or operators with facilities which can use catalytic oxidation. For these reasons, catalytic oxidation does not necessarily have any advantage over thermal incineration in terms of price impacts or competitive position of domestic producers relative to foreign competition, as suggested by the commenters. The potential impacts of domestic price increases associated with thermal incineration were investigated and are not considered to be large enough to significantly affect the competitive position of domestic producers relative to foreign competition. Using conservative (high) control cost estimates, chemical price increases are estimated to range from 0 to about 3 percent. Further, the potential for increased NO_x emissions associated with thermal incineration was also examined, but the rate of NO_x formation is expected to be low due to relatively low combustion temperatures and relatively short residence times.

One commenter stated that to achieve 98 percent emissions reduction with a catalytic oxidizer his firm would have to install a thermal incinerator after the catalytic oxidizer. In order to evaluate this statement, the Agency requested information to determine the cost effectiveness of achieving 98 percent destruction efficiency with catalytic oxidation. However, the commenter indicated that no data were available. Also, the Agency has recently tested the destruction efficiency of catalytic incineration for various VOC (see EPA-600/2-85-041). In this study, the Agency examined vent streams similar in characteristics to the commenter's vent stream. The results show that VOC destruction efficiencies greater than 98 percent were achieved with temperatures ranging from 800°F to 900°F and residence times ranging from 0.07 to 0.12 seconds. Thus, the Agency believes that catalytic incinerators can achieve 98 percent VOC destruction efficiency and does not

believe the commenter will need to install a thermal incinerator after a catalytic oxidizer.

2.3 MODIFICATION

2.3.1 COMMENT: One commenter (D-5) stated that the proposed regulation would apply to any air oxidation reactor which is modified such that there is an increase in the amount of any air pollutant emitted into the atmosphere. The commenter pointed out that this could include a reactor which is modified such that VOC emissions are decreased, but emissions of another pollutant are increased. The commenter recommended that the modification provisions be amended to include consideration of the following: (a) the specific pollutant which causes the process change to become a modification, (b) the amount of the increase in emissions, (c) the cost of the process change, and (d) the level of control prior to the process change.

RESPONSE: The General Provisions, 40 CFR 60.14, define a modification as "any physical or operational change to an existing facility which results in an increase in the emission rate to the atmosphere of any pollutant to which a standard applies" (emphasis added). In the case of the air oxidation regulation, the only pollutant to which the standard applies is VOC; therefore, only increased VOC emissions would result in an existing facility becoming subject to the NSPS modification provisions for air oxidation processes. However, a modification which results in the increase of another pollutant may cause a facility to have to comply with the provisions of another part of the CAA such as prevention of significant deterioration (PSD) or SIP requirements, or a different NSPS for a pollutant other than VOC.

2.4 ECONOMIC IMPACT

2.4.1 COMMENT: One commenter (D-7) stated that the economic feasibility threshold of 20 percent of total plant capital cost used in the economic analysis is too high. This commenter stated that the chemical industry is

already devoting 10 to 15 percent of capital investment in new plants to overall pollution control. This commenter pointed out that it is unreasonable to set an economic feasibility threshold for one type of pollution from one emission point at a level comparable to the total environmental control costs. Specifically, this commenter recommended that the cutoff figure be based on total capital costs for all forms of pollution control at air oxidation facilities.

RESPONSE: The economic impact of air oxidation NSPS controls is a function of the effects of the costs of compliance on the profitability of air oxidation projects and on the availability of capital for those projects. Profitability is the preferred measure of impact because of the profit maximizing objectives of firms. Implicit in the profitability measure is the likelihood that if a project meets profit objectives, the capital will become available.

The profitability analysis showed that air oxidation NSPS controls would not render projects economically infeasible that were otherwise economically feasible. An explicit capital availability measure was also applied to see if there might be circumstances where, regardless of expected profits, a firm would find it hard to raise the necessary funds for a project. The capital availability analysis showed that only one chemical might, under worst-case cost assumptions, be produced under conditions where the capital control costs exceed 20 percent of uncontrolled plant costs.

Unfortunately the Agency did not, and does not, have adequate, reliable data on the costs of building uncontrolled plants for all air oxidation processes. Reliance was placed on proprietary process economics data from Stanford Research Institute (SRI), but it was not possible to fully match SRI's plant parameters with those in the national statistical profile data base used to develop the air oxidation NSPS. Worst-case assumptions were made to ensure conservative results. The results of the capital availability analysis were used to identify chemicals and processes that warranted closer examination.

The analysis found only one chemical that might have capital control costs in excess of 20 percent of uncontrolled plant costs. It is 1,3-butadiene. Over 85 percent of 1,3-butadiene capacity utilizes nonair oxidation processes (extraction from ethylene plant by-product streams and dehydrogenation of n-butane). New plants are expected to be all ethylene by-product extraction plants. Only one air oxidation process is used today; this is the oxidative dehydrogenation of n-butenes. The July, 1983 Mannsville Chemical Products Synopsis on butadiene, and the SRI 1983 Directory of Chemical Producers report that only two firms used this process in 1982. One is the Firestone Synthetic Rubber and Latex Company, but it recently closed the plant, which was in Orange, Texas. The only remaining firm, Petro-Tex Chemical Corporation, operates a facility in Houston, Texas. However, Report 7 of Organic Chemical Manufacturing, Volume 10: Selected Processes (EPA-450/3-80-028e) states that the vent stream at this plant is controlled by a thermal oxidizer. Thus, it appears that no new, modified, or reconstructed 1,3-butadiene facility will have to install control equipment as a result of this NSPS. The future facilities either will be nonair oxidation, or will be in a situation where control would be installed even in the absence of this NSPS.

With more complete process economics data EPA could look into possible capital availability problems in more depth and for more of the air oxidation chemicals. Unfortunately, the needed information was not provided by this or any commenter.

The Agency also believes that the TRE cutoff will prevent situations where capital control costs become unduly large. The capital cost of an incinerator and associated equipment is mostly a function of the vent stream flow rate and the presence of halogenated compounds, which necessitates scrubbing. A high flow rate results in a high capital cost of control and a high TRE. Other things remaining unchanged, as the flow rate increases, the capital control costs as a percentage of the cost of an uncontrolled plant will increase, but so will the TRE value until the TRE cutoff is reached and control is no longer required. Because all other things do not remain unchanged, it is not possible to establish an unambiguous relationship

between the TRE cutoff and a corresponding cutoff percentage of plant costs that must go toward control equipment. However, it is clear that the TRE cutoff can, in rare instances where actual (not worst-case) capital control costs may exceed 5 or so percent of uncontrolled plant costs, serve to limit that percentage. Of course, one can postulate an extraordinarily cheap and inefficient plant -- one that produces more CO, CO_2, H_2O, and corrosive waste, than product -- where the TRE cutoff will not serve as a check on capital control costs as a percentage of uncontrolled plant cost. The EPA does not consider such plants as likely.

The commenter also recommended that any criterion relating to capital constraints be based on the total capital costs for all forms of environmental pollution control. Section 8.2 of the BID (EPA-450/3-82-001a) discusses the overall burden of environmental regulations on firms that may be affected by the air oxidation NSPS. This discussion centers on total annualized costs; that is, on capital and annual operating costs combined. The EPA believes these annualized costs more accurately represent potential burden on affected firms than do capital costs.

In short, EPA believes this NSPS will not impose unduly restrictive capital problems on any segment of the chemical industry.

2.4.2 COMMENT: One commenter (D-9) stated that some plants have been inaccurately recorded in the BID. This commenter listed Shell Chemical Company plants that are either no longer producing an air oxidation chemical or have changed to nonair oxidation processes. Finally, this commenter stated that if these inaccuracies are widespread, a review of basic data may be advisable to ensure that they support the NSPS.

RESPONSE: Given that one of the earliest stages in the regulatory standard-setting process involves data collection, it is not surprising that some of the data are no longer current. Although the BID was published in October 1983, many of the data go back to 1978. Continual updating is expensive and can be unnecessarily burdensome to companies and trade groups that participate in the cost updating procedure. For this reason, generally

EPA only updates data considered essential to support the NSPS. For other data, EPA relies on comments submitted by companies like Shell Chemical to decide whether updating is necessary. It should be noted that Shell submitted the only comment in this regard. Thus, although it would be nice to have the list of producers of air oxidation chemicals current as of today, the list of producers has minimal bearing on the economic impact analysis and the standard itself. The EPA concludes that there is no need to update the list of producers or the economic impact analysis.

2.5 COST ESTIMATION

2.5.1 COMMENT: One commenter (D-2) recommended that all costs discussed in the preamble be inflated from 1978 dollars to fall 1983 dollars. This commenter indicated that the cost-effectiveness cutoff would then become $2,600/Mg instead of $1,900/Mg.

RESPONSE: The Agency agrees that the cost-effectiveness cutoff of $1,900/Mg (December 1978 dollars) would be about $2,600/Mg in fall 1983 dollars. However, EPA maintains that this would not change the analysis or the requirements of the standards. When the analysis for the air oxidation NSPS was begun, it was decided that 1978 would be the appropriate base year for costs because more recent data were not available. If the implicit price deflator for the gross national product is applied, the cost-effectiveness cutoff inflates 40 percent over the 5-year period. However, regardless of whether it is expressed in 1978 or 1983 dollars, the cost-effectiveness cutoff has the same impact. If a given facility cost effectiveness is increased 40 percent by an inflation factor to $2,600/Mg, the cost-effectiveness cutoff will also increase by 40 percent, since both values are calculated using the same cost assumptions. Thus, the ratio will remain the same, and the TRE index cutoff value will still be 1.0. Inflation does not affect the validity of the TRE index. Furthermore, in considering an inflated TRE cutoff, it should also be realized that the value of the benefits associated with the standards are also inflated accordingly. Thus,

EPA plans no change in the base year dollars for the costs discussed in the preamble.

2.5.2 COMMENT: Two commenters (D-2 and D-7, D-14) stated that several oversights and flawed assumptions exist in the cost estimation procedure. Both commenters asserted that capital cost estimates allow for only 150 feet of ductwork between the source and the thermal incinerator, although 300 to 500 feet would generally be required. Both commenters also indicated that EPA failed to include in the capital cost component the total cost of siting, bringing utilities to the site, and piping and instrumentation connections. One commenter (D-2) stated that the capital cost estimate should be increased by at least 10 percent to account for these oversights. In addition, both commenters mentioned operating costs that were ignored include maintenance-related labor costs, operating supplies, and laboratory costs. Both commenters suggested that a factor of 40 percent of maintenance and operating labor be added to compensate for these oversights, as was done in the BID for petroleum refining operations. One commenter (D-7, D-14) also asserted that annualized costs should include an allowance of 15 percent of labor costs for direct supervision, as listed in the BID for polymer manufacturing.

RESPONSE: In response to these statements claiming that the costing procedures contain flawed assumptions, the Agency reviewed the procedures in great detail. Revisions were made where determined to be appropriate for ensuring that the costing procedures result in representative costs. Throughout the development of the air oxidation NSPS the Agency has made efforts to ensure that the costing procedures result in estimates that adequately represent control costs anticipated to be incurred by the majority of facilities in the industry. Prior to proposal, industry members were given the opportunity to provide substantial input into the development of the costing procedures. Preliminary costing assumptions were reviewed by industry and subsequently revised based upon industry input. After proposal, costing assumption revisions were prepared and presented in a supplemental Federal Register notice (50 FR 20446) on May 16, 1985. This notice solicited

further comments on costing procedures. The bases for these revisions are documented in Docket Item No. IV-B-8. As a result of the initial industry involvement and the recent revisions based on industry public comments, the Agency feels confident that the costing procedures result in accurate estimates for typical air oxidation facilities. The specific assumptions that are key for ensuring representative cost estimates are discussed below.

Certain assumptions were included in the procedures to avoid underestimating costs incurred by facilities using combustion to control VOC. These assumptions were made to ensure that control equipment sizes and supplemental gas requirements were not underestimated. First, vent streams were assumed to contain no oxygen to maximize estimated combustion air requirements. Most streams, while not containing 21 percent oxygen, have some smaller percentage of oxygen present. The assumption of no oxygen ensures that no underestimate will occur for the equipment size, the combustion air flow rate, and the amount of supplemental natural gas needed. Second, actual offgas flow rate was increased by 5 percent in calculating costs, which inflated gas consumption and equipment size by 5 percent. Third, the temperatures and residence times assumed for cost estimation purposes (1,600^{o}F/.75 sec for nonhalogenated streams, 2,000^{o}F/1 sec for halogenated streams) are the highest temperature and residence time conditions necessary to achieve a 98 percent VOC destruction efficiency for air oxidation vent streams, as discussed in Appendix A of the proposal BID. These higher temperatures and residence times would result in a larger equipment size and higher gas consumption than the majority of air oxidation facilities require. Fourth, the overall installation factors assumed for new sources were 4.0, 2.5, and 3.5 for the combustion chamber, heat exchanger, and waste heat boiler, respectively. These factors were all higher than the EPA GARD Manual recommended factor of 2.17 (EPA-450/5-80-002) because they incorporate contingencies recommended by the industry to account for equipment that was not originally specified in the costing procedure.

Revisions were made where appropriate in the capital cost and the annual operating cost assumptions used in the procedures. For example, in the capital cost component of the procedures, the ductwork length was changed

from 150 feet to 300 feet. The ductwork length increase is based on specifications provided by the Industrial Risk Insurers (IRI) and the National Fire Protection Association (NFPA). These organizations present recommended distances for safely locating combustion sources from process units in chemical plants. The recommended distance for locating a closed combustion source such as an incinerator from a process unit is 200 feet. An additional 100 feet was added to the IRI and NFPA recommendation to account for routing the stream around process equipment before routing it away from the process unit. The 300-foot figure is believed to be more representative of industry conditions and is within the range recommended by the commenter.

In addition to the ductwork length change, the capital cost component of the procedures also was modified to include 250 feet of pipe rack. The Agency judged that since the standards will probably require the use of new rather than existing incinerators and since newly constructed incinerators would require about 300 feet of ductwork, it is reasonable to assume that existing structures may not be available to support the piping. However, the 250 feet of pipe rack assumes that 50 feet of the 300 feet of ductwork would be supported by existing structures.

Several revisions were also made in the annual operating cost component of the procedures. These were revisions in the labor rate, in the calculation of total labor cost, and in the gas and electricity prices used. All these annual operating cost revisions are discussed below and are explained in more detail in a memorandum to the SOCMI air oxidation NSPS files (Docket Item No. IV-B-8). The labor rate was changed to reflect more accurately the actual value for 1978. The original incinerator labor costing was based on a labor rate (including overhead) in 1979 dollars that was deescalated to 1978 dollars. The new labor rate is based on actual U. S. Bureau of Labor Statistics for 1978 and does not include overhead and fringe benefits.

The revisions in the calculation of total labor cost were made to explicitly calculate the cost attributable to overhead and fringe benefits. The overall changes in the total labor cost calculation included: (1) calculation of the supervisory labor cost as 15 percent of the operating labor cost; (2) calculation of the overhead cost as 80 percent of the sum of

operating, supervisory, and maintenance labor costs; and (3) calculation of total labor cost as the sum of operating, supervisory, maintenance, and overhead labor costs.

The natural gas price used in the costing procedures was revised to represent more accurately the projected effects of natural gas deregulation and account for regional variations in gas price. The previous estimate of natural gas was based on prices projected through the first 5 years of the regulation and then was deflated to 1978 dollars. This was done to reflect the fact that gas prices have been rising more rapidly than inflation. The previous estimate was made during a period of rapidly increasing energy prices. However, the actual rate of increase has slowed since that original estimate was made. Thus, to improve the accuracy and representativeness of the gas price, a new projection was made. The gas price was derived by projecting regional gas prices to 1990, taking a nationwide 1990 gas price that was weighted geographically, and then deflating to 1978 dollars.

The price for electricity was modified to provide for a more accurate estimate of 1978 costs. Although the electricity was originally based on 1978 costs, further examination showed that a more representative price could be used.

Several of the commenters' suggestions were not incorporated in the procedures because they were not justified. The recommended capital cost items that were judged to be inappropriate included the costs for siting, bringing utilities to the site, and piping and instrumentation connections. The cost associated with bringing utilities to the site was not included because the control device will be located in the proximity of the process unit where utilities are readily accessible. It was not necessary to include the cost for siting because this has already been included. An equipment cost installation factor of 1.35, which increased equipment purchase price by 35 percent, was used to account for site development, fees, and general contingencies. Neither was it necessary to include the cost associated with piping and instrumentation connections, because these were already incorporated. An equipment cost installation factor of 1.20 was used to increase the equipment purchase price by 20 percent to account for unspecified

equipment. Also, an overall correction factor of 1.33 was used to increase equipment purchase price by 33 percent to account for any miscellaneous items associated with purchasing and installing control equipment that may have been overlooked.

Some annual operating cost items recommended by the commenters were also judged to be inappropriate. The items identified by the commenters included maintenance-related labor costs, operating supplies, and laboratory costs. It was not necessary to include maintenance-related labor costs because these are already incorporated in the maintenance labor factor, which is calculated as 3 percent of the total installed capital cost. Similarly, the cost associated with operating supplies was not a missing item but was already incorporated in the maintenance materials factor, which is calculated as 3 percent of the installed capital cost. Finally, it was determined that laboratory expenses, such as those involved with testing scrubbing wastewater effluent, are part of the normal operating and maintenance cost for an incinerator/scrubber system that would be used to control vent streams with halogenated compounds. Thus, factors for maintenance labor and maintenance materials associated with such a system would incorporate laboratory expenses.

In summary, the revised costing procedures do not result in annualized costs that are significantly different from the costs estimated using the procedures used at proposal. An examination of the data showed that depending on the vent stream characteristics of a facility, the annualized cost increased for some facilities and decreased for others. For the most common type of air oxidation vent stream (Category B - nonhalogenated stream with net heating value below 0.48 MJ/m3), the annualized cost increased by about 3 percent.

2.5.3 COMMENT: Two commenters (D-2 and D-7) identified two discrepancies in the cost information presented in the proposal BID. First, for a given set of vent stream characteristics, the total capital cost obtained from Figures G-1, G-2, and G-4 does not agree with the total capital cost obtained from Figure G-9 (a composite of Figures G-1, G-2, and G-4).

For example, the commenter refers to a case based on a 10,000 scfm, 10 Btu/scf, Category B stream with 70 percent recuperative heat recovery. In this situation, the capital cost obtained from Figures G-1, G-2, and G-4 is $922,000, while the capital cost obtained from Figure G-9 is $850,000. One commenter (D-2) noted a second discrepancy between the annualized incinerator cost components given in Tables 8-5 and 8-7 of the BID and those used in Table E-2. This commenter said that the investment multiplier in Table E-2 is higher than the investment multiplier in Table 8-5. Although the annualized costs listed in Table E-2 appear to be in mid-1980 dollars, the hourly rate for labor is lower.

RESPONSE: The Agency acknowledges the discrepancy noted by the commenter concerning total installed capital costs obtained from Figures G-1, G-2, G-4, and G-9. Upon checking the original data from which these graphs were derived, the Agency has determined that the costs obtained from the summation of the graphs showing individual component costs (i.e., G-1, G-2, G-4) are correct. The composite graph (i.e., G-9), which should give the aggregate of the total installed capital costs obtained from the individual component graphs, is incorrect. However, even without correction, the impacts of this error in the graph showing installed capital cost on the total annualized cost would be relatively small. The impacts would be relatively small because: (a) the error in the graph showing installed capital cost is relatively small for most vent streams; and (b) the installed capital cost, when annualized over the 10-year period, represents a small fraction of the total annualized cost. Nevertheless, the Agency modified the cost equations to correct the small discrepancy. The Agency has also revised the table of TRE coefficients to make the TRE index equation reflect these changes. A corrected copy of Table 8-5, which presents the capital cost coefficients used in the cost equation, will be presented in Appendix B of the promulgation BID.

The Agency also acknowledges the discrepancy noted by commenter (D-2) concerning cost factors given in Tables 8-5, 8-7, and E-2. The cost factors presented in Tables 8-5 and 8-7 are correct. The information presented in

Appendix E comes from a similar appendix prepared for the air oxidation Control Techniques Guideline (CTG) document. The cost factors from Tables 8-5 and 8-7 were used in developing the TRE equation and coefficients presented in the proposal regulation. However, it should be noted that some of these factors have been revised. As indicated in the previous response the gas, labor, and electricity factors were modified to improve the accuracy and representativeness of the cost algorithm. These changes are explained and documented in a memorandum to the SOCMI air oxidation NSPS docket (Item No. IV-B-8). A corrected version of the appendix concerning TRE calculations will be included in Appendix A of the promulgation BID. The cost factors presented in the CTG have also been revised so that they are on a consistent basis with the factors used in the air oxidation NSPS algorithm.

2.5.4 COMMENT: Two commenters (D-2 and D-7) disagreed with the assertion in the preamble that annualized costs associated with the disposal of sodium chloride from scrubbing incinerator flue gases containing halogenated compounds are insignificant and, therefore, are not included in the cost estimates. Both commenters stated that disposal will be expensive unless the plant is located near salt water and can get a permit to dump its brine.

RESPONSE: Brine solutions are currently disposed of in a variety of ways depending on site-specific conditions. These include direct discharge to sewer systems and surface waters (fresh and salt water bodies or rivers), discharge to evaporative lagoons, and injection into a disposal well. Because it is not possible to determine which options will be selected by the individual facilities analyzed, it would be impractical to represent all of these types of brine disposal in the cost analysis. Therefore, the costs anticipated to occur at the majority of facilities handling halogenated compounds were considered instead.

Data available to the Agency shows that most air oxidation plants producing halogenated waste streams are located near the coast (see Table 3-6 of the Air Oxidation proposal BID,) where brine can be disposed of at a low

cost either directly or indirectly into salt water (e.g., ocean or brackish stream direct discharge). The Agency believes that most new, modified, and reconstructed facilities will continue to use this relatively low cost disposal option. For those few that may not, EPA believes the other relatively low cost options will be used (e.g., fresh water or sewer discharge) since available data show that industrial facilities with waste streams similar to those from air oxidation plants are currently using these disposal options extensively. Therefore, the Agency has no reason to believe that any air oxidation facility will face a significant brine disposal cost as a result of this NSPS (Docket Item No. IV-B-9).

2.6 COST EFFECTIVENESS

2.6.1 COMMENT: Three commenters (D-2, D-6, and D-7, D-14) indicated that the $1,900/Mg cost effectiveness cutoff is unreasonable. One commenter (D-6, D-6a) recommended that the cutoff be raised to a level higher than $1,900/Mg so that the standards cover a greater number of emission sources and, thus, a greater amount of emissions. This recommendation is based on the commenter's perception that the inclusion of a greater number of sources would reduce public exposure to pollutants emitted by air oxidation reactors, including potentially hazardous pollutants. This commenter also stated that cost effectiveness is inappropriate as the sole determinant for excluding certain air oxidation reactors from the application of the proposed standards. The commenter stated that cost effectiveness is an invalid basis for deciding not to set standards on processes for which no perceptible economic impacts have been shown. Two commenters (D-2 and D-7) stated that the cost-effectiveness cutoff should be reduced to a lower level which is more typical of VOC standards. Both commenters stated that the Agency has not presented adequate justification for concluding that a $1,900/Mg cost-effectiveness cutoff is a reasonable upper limit for application of the standards. Specifically, these commenters assert that this higher figure cannot be justified based on the presence of toxic constituents in the discharge streams from air oxidation reactors. They point out that the

control of toxic pollutants is the objective of standards developed under Section 112 of the CAA [National Emission Standards for Hazardous Air Pollutants (NESHAP)] and not standards such as these which are being proposed pursuant to Section 111 of the Act (NSPS). The first commenter (D-7, D-14) stated that the Agency: (1) has not presented data which quantifies the presence of toxic pollutants in the emissions from air oxidation processes, (2) has made no effort to correlate the costs of control with the degree to which toxic pollutants are eliminated, and (3) has not shown that toxic pollutants will be controlled to the same degree as other pollutants under the proposed standards. The second commenter (D-2) contended that the preamble does not adequately demonstrate that the presence of toxic pollutants in the emissions from air oxidation reactors are sufficiently different from the emissions from other VOC sources to justify a special consideration of their hazards. Both commenters also state that although the cost of controlling VOC emissions is analyzed as a "worst-case" situation, there are facilities which will have to incur costs as high as $1,900/Mg. They contend that the Agency has not justified costs this high as being either reasonable or appropriate for these facilities.

RESPONSE: The EPA believes that its decision to consider cost-effectiveness when determining the cutoff for applying the standards reflects a reasonable interpretation of Section 111 of the CAA. In analyzing the question whether the consideration of cost effectiveness is appropriate, EPA looked to see whether Congress has "directly spoken to the precise question." Chevron, U.S.A., Inc. v. NRCD, 467 U.S. 837, 104 S.Ct. 2778, 2782 (1984). Section 111 requires EPA to promulgate NSPS limiting emissions to the level that reflects the best system of emissions reduction "which (taking into consideration the cost of achieving such emission reduction, any nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated." Section 111(a)(1). Nothing in either Section 111 or elsewhere in the Act defines "the cost of achieving such emission reduction." The plain meaning of the phrase, however, is quite broad. This indicates that Congress implicitly delegated to EPA the authority to interpret the phrase to encompass a range

of impacts, including costs of control in relation to the emission reduction achieved. Further, Congress did not specify any particular manner in which EPA was to take these costs "into consideration." Thus, absent a clear Congressional direction to the contrary discernible from the Act's history, Chevron, 104 S.Ct. at 2783, Section 111 gives EPA authority to reject NSPS control options on the ground that their costs are unreasonably high in light of the emissions reductions they achieve. 1/

The EPA has reviewed the legislative history of Section 111 and concluded that no contrary intent is discernible. Most important, the history contains no express repudiation of the use of cost effectiveness as one mechanism in considering cost when setting an NSPS.

For these reasons, EPA believes that Congress implicitly delegated the Agency the authority to decide how best to "take into consideration...cost" in setting NSPS and, if the Agency concluded it was appropriate, to consider cost effectiveness.

Further, in Portland Cememt Association v. Train, 513 F.2d 506, 508 (D.C. Cir. 1975), cert. denied, 416 U. S. 1025 (1975) ("Portland II"), the Court stated that EPA may reject control options that result in a "gross disproportion between achievable reduction in emissions and cost of the control technique." Since the purpose of cost-effectiveness analysis is to highlight such disproportion, this passage supports EPA's approach.

In selecting cutoffs related to applicability of NSPS, EPA looks at a variety of factors including: (1) the technical feasibility of additional control; (2) the economic feasibility associated with different control alternatives; (3) the magnitude of emission reductions associated with a control alternative (e.g., a slightly higher cutoff could be selected if it

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1/For instance, Congress provided a more specific restriction on the consideration of costs on Part C of the Act. Section 169(3) defines "best available control technology" as "an emissions limitation based upon the maximum degree of reduction...taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such facility..." (Emphasis added). Here it is more likely that Congress intended to ensure the maximum control considering case-by-case economic impacts but regardless of cost effectiveness.

led to a substantial increase in the emission reduction achieved by the NSPS); (4) the cost effectiveness (C/E) of the control alternative in terms of annual cost per megagram ($/Mg) of emissions reduced; (5) the quality of the cost estimates (e.g., worst case versus realistic estimates); (6) potential reductions in other air pollutants not specifically regulated by the NSPS resulting from a control alternative; and (7) the location of the sources (e.g., urban versus rural). Because these factors vary from industry to industry and, in some cases, within the same industry, decisions on the appropriate level of control are made on a category-by-category basis.

In evaluating the above factors, EPA found that the following considerations were key to the selection of the appropriate cutoff for SOCMI air oxidation processes: (1) the cost effectiveness of NSPS for VOC emissions previously promulgated by the EPA; (2) the fact that air oxidation vent streams contain compounds that are considered potentially toxic by EPA; and (3) the likelihood that these maximum costs will not be incurred by industry.

A survey of the VOC standards for other source categories shows that the cost effectiveness of those control requirements has sometimes ranged as high as $2,000/Mg. (See Docket Item No. IV-B-14.) The Agency's experience in implementing these standards reveals that NSPS requiring this level of control have proved a useful tool in bringing about the installation of much emissions control technology, significant reductions in emissions, and corresponding improvements in air quality, yet have not imposed costs that appear "grossly disproportionate" to the emission reduction achieved. Portland II, 513 F.2d at 508. Such an approach simply makes this NSPS consistent (as to dollars spent per metric ton of VOC removed) with the existing body of NSPS regulations, all of which have either been promulgated without legal challenge or have been judicially upheld.

EPA also considered available evidence that air oxidation streams include compounds that may be toxic. 2/ Although that evidence has not yet resulted

2/ The Agency has adequately documented that this is the case. (See Wehrum, W. et al., "Air Toxics Emission Patterns and Trends", Docket Item No. IV-A-3, and Registry of Toxic Effects on Chemical Substances, Docket Item No. IV-J-9). Moreover, it is apparent that combustion of those streams will reduce those compounds proportionately. (See, e.g., "Thermal Incinerator Performance for NSPS", Docket Item No. II-B-3). The Agency received no comment questioning this documentation.

in a determination that those compounds should be listed as hazardous under Section 112, EPA considered this potential toxicity along with other relevant factors when choosing the cutoff. As stated in EPA's Air Toxic Strategy published in July 1985, the Agency will consider the likely toxic pollutant control benefits in the course of carrying out its responsibilities under Section 111. This strategy reduces emissions of potentially toxic compounds from new sources and from industries as their facilities are reconstructed or modified. This approach achieves significant reductions in these compounds of concern while the Agency evaluates them for regulation under Section 112. The Agency disagrees with the argument that EPA has no authority to do this. The EPA is not attempting here to regulate streams based on a decision that they contain hazardous air pollutants within the meaning of Section 112. Rather, the Agency is simply considering all available evidence within the framework of Section 111. Section 111 does not attempt to restrict EPA's discretion to consider all relevant factors in making that decision, and certainly the potential toxicity of a stream is relevant to the control requirement selected. Many SOCMI facilities are located in urban areas and, as a result, many people will be exposed to any hazardous air pollutants emitted from these facilities.

A third consideration in setting the cutoff at $1,900/Mg is the likelihood that no facility will actually have to incur the costs implied by that cutoff. The reasons are: (a) less expensive combustion control may be used, thus reducing the costs and cost effectiveness incurred by individual facilities; (b) the cost estimates for thermal incinerators and natural gas prices are overstated; and (c) the inherent flexibility within the regulation encourages the use of product recovery modifications that will significantly reduce the cost incurred by individual facilities that may have otherwise had to add a combustion device. The regulatory analysis assumes that each air oxidation process vent would have its own combustion device and would need separate ducting and support structures. It is expected, however, that some air oxidation processes will share control systems with other process vents. The analysis also assumes that thermal incinerators or flares will be useful to reduce VOC emissions by 98 weight-percent. Data on current capital costs of thermal incinerators indicate that units are now available at substantially

reduced costs compared to the costs used in developing these standards. Lower capital costs would reduce the annualized costs estimates, also, but not as significantly. This is an important consideration in selecting the appropriate cost-effectiveness cutoff. Another consideration is the fact that natural gas prices used to calculate the cost-effectiveness for each stream are overstated by about 40 percent, even though they were updated after proposal (see following section on "Costing Revisions"). These conservative assumptions have resulted in higher cost and cost-effectiveness estimates than will actually occur. Finally, the standard encourages pollution prevention by not requiring 98 weight-percent reduction if a TRE index greater than 1.0 is maintained. The EPA believes that many facilities having a TRE index just below the 1.0 cutoff (equivalent to $1,900/Mg) will upgrade product recovery to reduce VOC and raise their TRE index above 1.0. This will significantly reduce the cost of control incurred by the industry while reducing emissions and will also minimize the national energy impacts. A preliminary examination of the national statistical profile shows that because many facilities have the potential to reduce VOC emissions sufficiently to raise their TRE values above 1.0, the highest cost effectiveness that a facility will actually incur as a result of installing a combustion device is estimated to be approximately $1,400/Mg.

The EPA believes that this process reflects a reasoned interpretation of the phrase "taking into consideration the cost of achieving such emission reduction," especially given the lack of clear Congressional guidance. The commenters' arguments that EPA should have selected either a higher cutoff to provide for a greater degree of protection of the public health, or a lower cutoff because most VOC standards have lower costs in relation to the resulting emission reduction, fail to provide a more reasoned methodology for selecting the appropriate level. Instead, they merely reflect each of the competing goals reflected in Section 111's history, as described above.

Consideration of all of the above factors confirmed EPA's belief that a TRE value of 1.0 (i.e., $1,900/Mg) represents an appropriate cutoff for determining which facilities must reduce VOC emissions by 98 weight-percent or to 20 ppmv. The cutoff is specific to the SOCMI air oxidation processes sources category and would not necessarily be appropriate for other source categories; therefore, it should not be viewed as a benchmark for other standards.

2.6.2 COMMENT: One commenter (D-5) stated that the incremental cost and energy impacts of requiring 98 percent control versus 95 percent control of VOC emissions from affected facilities should be investigated further. Specifically, the commenter believes the Agency should consider that source-specific conditions such as fuel value, temperature, and volume vary widely.

RESPONSE: The Agency has determined that 98 percent destruction efficiency represents BDT. In determining the level of control which represents BDT, the Agency examined emissions data from incinerators already operating within the industry as well as incinerator tests conducted by the Agency and by chemical companies. The data show that all the new, well operated incinerators were achieving 98 percent destruction efficiency or could achieve 98 percent after adjustment. The Agency also found that at the lower temperature and shorter residence time required for lower efficiencies, some VOC may not come into contact with sufficient oxygen at a high enough

temperature to enable the oxidation of VOC to proceed to completion. As a result, there is greater chance that partially oxidized organic compounds (e.g., aldehydes) and carbon monoxide may be generated.

As indicated in the response to comment 2.2.3, the air oxidation standards are structured in a way which prevents any facilities from incurring an unreasonable cost effectiveness. The Agency has found that because of the wide variation in vent stream characteristics, both the cost and cost effectiveness of control may vary considerably depending on the chemical and the process. Further, the Agency has determined that the cost of control would be unreasonable for some facilities. Consequently, the standards are structured with the TRE index cutoff to require only those facilities that can control cost effectively to achieve a 98 weight-percent reduction efficiency or reduction to 20 ppmv.

The Agency recognizes that there are source-specific characteristics (e.g., market conditions, process design, and geographic conditions) that may impact the cost of VOC emissions control for individual facilities. To address the source-specific characteristics would have required separate standards for each facility reflecting the differences in source-specific characteristics. The Agency is unable with the available information and resources to evaluate all source-specific characteristics of each facility that could potentially be affected by the air oxidation NSPS.

2.7 MONITORING AND MEASUREMENT METHODS

2.7.1 COMMENT: One commenter (D-7) stated that the requirements for continuous monitoring of VOC are unclear. This commenter indicated that the proposed NSPS could be read to require continuous monitoring even during periods of start-up and shutdown. Specifically, this commenter pointed out that this interpretation is arbitrary and inconsistent with the EPA general enforcement policy. This commenter said that EPA regulations normally allow for temporary excursions due to start-up and shutdown.

RESPONSE: The General Provisions, at 40 CFR 60.8(c), do allow for temporary excursions due to start-up and shutdown of the affected facility. This means that emission levels during these periods are not counted as violations if they exceed the levels specified in the regulation. This does not mean that a facility is exempt from monitoring requirements during these periods; on the contrary, Section 60.13(e) states that "except for system breakdowns, repairs, calibration checks, and zero and span adjustments . . ., all continuous monitoring systems shall be in continuous operation." In addition, Section 60.11(d) states that any affected facility and associated air pollution control equipment must, to the extent practicable, be maintained and operated at all times, including periods of start-up, shutdown, or malfunction of the affected facility. Monitoring is necessary to determine how often and for how long periods of start-up, shutdown, or malfunction occur and to assure that the affected facility and control device are being operated in a manner consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based, in part, on monitoring results. Therefore, it is essential that monitoring be conducted continuously.

2.7.2 COMMENT: One commenter (D-11) agreed with EPA and stated that it is appropriate to waive performance tests and monitoring requirements for sources incinerating process vent streams in steam generating devices that have heat input capacities of 44 MW (150 million Btu/hr) or greater. This commenter suggested that the following conditions be required for exemption from performance testing and monitoring requirements: (a) boilers with heat input capacity of 44 MW (150 million Btu/hr) or greater, (b) combustion devices maintaining a combustion temperature of 1,100^{o}C and 1 second residence time, and (c) incineration devices maintaining a temperature of 870^{o}C and 0.75 second residence time if no halogenated organic compounds are present in the vent gas.

RESPONSE: The EPA believes that condition (a) mentioned by the commenter is sufficient for exemption from performance tests. However, conditions (b) and (c) mentioned by the commenter are not sufficient. An incineration device operated at temperatures greater than 1,100°C and 1 second residence time (870°C and 0.75 second residence time for non-halogenated streams) will achieve a 98 percent VOC reduction providing that proper mixing has been achieved. The reactor offgas, combustion gases, and supplemental air must be well mixed in order to achieve complete combustion. The EPA has determined that proper mixing is, in fact, as important as temperature and residence time in determining incinerator efficiency. This concept is explained in an EPA memorandum (Docket Item No. II-B-3). Improperly mixed gases may actually offset the increases in efficiency generated by raising the combustion temperature. This is due to the fact that increases in temperature only increase the destruction efficiency for VOC within the well-mixed portion of the waste gas. In an improperly mixed stream, therefore, the increase in temperature does not greatly affect combustion efficiency.

Unfortunately, mixing is a variable which cannot be measured. Proper mixing is generally achieved through a trial-and-error process of adjusting the incinerator after start-up. There is no practical method of ensuring that proper mixing occurs except by conducting a performance test and making the necessary adjustments. For this reason, incinerators operating at the temperatures and residence times expressed by the commenter in conditions (b) and (c) are not exempt from the performance test requirements.

The EPA has determined that steam generating units with heat input capacities of 44 MW (150 million Btu/hr) or greater consistently achieve proper mixing. These units have conditions of temperature and residence time that generally are well in excess of the most severe conditions necessary to achieve 98 percent efficiency. It is to the economic advantage of the owner or operator to design and operate such devices with very good mixing of gases to maximize the combustion efficiency and subsequent steam generation rate. Thus, these steam generating units are exempt from the performance test requirement of the standards.

2.7.3 COMMENT: One commenter (D-11) suggested that EPA provide for alternative methods of demonstrating compliance when air oxidation process emissions are combined with other emission sources within the plant. For example, vent gases from air oxidation processes may be incinerated in wood-fired boilers. Since wood-fired boilers inherently generate VOC emissions, demonstration of compliance with the proposed regulation may be difficult.

RESPONSE: The General Provisions, 40 CFR 60.8, state that the Administrator may approve the use of "an alternative method [of demonstrating compliance] the results of which [s]he has determined to be adequate for indicating whether a specific source is in compliance" with a standard. This is applicable to all NSPS and need not be specified in the regulation.

When air oxidation streams are combined with nonair oxidation offgas streams within the plant, compliance of the combined stream may be demonstrated using Reference Method 18 or an alternative method approved for the particular facility by the Administrator. The EPA has determined that if compliance is demonstrated with the combined stream, compliance would also be achieved when routing the air oxidation stream alone.

In the commenter's example wherein a wood-fired boiler is used to incinerate air oxidation vent gases, VOC will be generated by the combustion device itself. In this case, the total VOC reduction would still have to be 98 percent. If the VOC generated by the wood-fired boiler prevents this, the affected facility will not be considered in compliance with the standards.

2.7.4 COMMENT: One commenter (D-2) suggested that EPA define the term "continuous" from Section 60.611 to represent a record with data sampled and recorded at a frequency of at least 1 percent of the compliance period. This commenter stated that such a definition would enable EPA to achieve its purposes while still allowing industry to use a documentation system compatible with existing computer-assisted control systems. This commenter said that existing monitors record at a frequency varying from a few seconds to several minutes. The commenter also stated that a separate analog system with a continuous recorder would be difficult to implement.

RESPONSE: The EPA has agreed to clarify the meaning of "continuous" in Section 60.611 as follows: "'Continuous recorder' means a data recording device recording an instantaneous data value at least once every 15 minutes." This definition will enable industry to use existing computerized data control systems attached to a measurement device. Furthermore, this time interval has been found to be an adequate time period for providing EPA with sufficient data to ensure proper operation and maintenance of VOC control equipment.

2.7.5 COMMENT: One commenter (D-11) stated that alternative measurement methods should be considered for demonstrating compliance with the proposed standards. This commenter stated that under the proposed regulation, Method 18 is required for demonstrating compliance and would necessitate that certain plants in the industry develop an analytical procedure with sufficient sensitivity to demonstrate compliance with the standards. This commenter indicated that other methods with sufficient sensitivity to determine compliance are already available.

RESPONSE: As with comment 2.7.3, the General Provisions (40 CFR 60.8) permit the Administrator to approve alternative means of demonstrating compliance on a case-by-case basis, providing the proposed alternative method is adequate for this purpose, or to waive compliance demonstration requirements if the owner or operator has already adequately demonstrated compliance. Since the General provisions are applicable to all NSPS, provisions for approval of test methods need not be specifically stated in the regulation.

2.7.6 COMMENT: One commenter (D-4) stated that the 98 percent VOC destruction efficiency required for thermal incinerators should be verified by analytical measurements and not just by operating temperature. The commenter stated that this would provide a more accurate performance assessment and, thus, enable both users and governmental monitoring authorities to judge the relative merits of various control equipment designs against a consistent standard.

RESPONSE: The standards already require an initial performance test to determine mass destruction efficiency using sampling and analytical methods, as suggested by the commenter. During the initial performance test used to demonstrate that the thermal incinerator is achieving 98 weight-percent reduction of VOC emissions, the temperature is measured continuously. If the efficiency is verified, then the temperature measured is used as a baseline by which the owner or operator can determine proper operation and maintenance of the control equipment, and it indicates that conditions have remained unchanged from the initial performance test conditions. Deviations from this "optimal" temperature can indicate significant decreases in control device efficiency. Because of this, once initial performance testing has been performed and a temperature baseline has been set, temperature monitoring alone is sufficient to demonstrate proper operation and maintenance.

2.7.7 COMMENT: One commenter (D-3) stated that the sampling site for TRE measurement should be located after a catalytic oxidizer when such a unit is employed as an integral part of the system. The commenter also pointed to an apparent inconsistency in the treatment of catalytic oxidation between the BID and the proposed regulation. The commenter indicated that although the in-process catalytic oxidizer is properly discussed in the BID, no rationale is presented in either the BID or the preamble to the proposed regulation for the exclusion.

RESPONSE: The CAA authorizes the Agency to minimize the emissions at new, modified, and reconstructed sources by application of BDT. The injunction does not constrain the Agency from regulating points that are an integral part of the process (i.e., points other than the final emission vent to the atmosphere) for a facility within a particular industry. Certain integral process points may be regulated when these points include devices that are normally used as control units. The catalytic oxidation unit to which the commenter refers is employed as an essential element in an integrated air compression/energy recovery system. Although the unit is not used as a terminal control device, it is an efficient VOC destruction device and, as such, performs the function of a control device. For the air oxidation

NSPS, the use of a catalytic oxidizer is not excluded and the unit may be employed as a control device when compliance testing shows a 98 percent VOC destruction efficiency or 20 ppmv VOC emission limit (i.e., the control level associated with BDT, thermal incineration). Based upon available data, the Agency believes that catalytic oxidation units can achieve a 98 percent destruction efficiency or 20 ppmv emission limit in cases where they are applicable. The Agency has determined that for streams with a TRE index below 1.0 (i.e., measured after the final recovery device but prior to a control device), the cost of control would be reasonable. Thus, the Agency believes it is proper to require the TRE measurement before the inlet to the catalytic oxidation unit.

2.8 EXEMPTIONS

2.8.1 COMMENT: One commenter (D-5) stated that the regulation should provide for an exemption in the case of organic pollutants which have been demonstrated to possess a negligible ozone-producing capability (i.e., are not photochemically reactive). This commenter indicated that no consideration has been given to the ozone-producing potential of individual VOC species.

RESPONSE: The air oxidation NSPS are intended to cover air oxidation facilities that emit VOC (i.e., compounds which participate in atmospheric photochemical reactions to produce ozone). Since compounds with negligible photochemical reactivity do not contribute appreciably to the formation of ozone, the Agency believes that it is appropriate to exclude these compounds in determining a TRE index. Facilities should measure only VOC, rather than TOC, when quantifying the hourly emissions rate for input into the TRE equation. For example, if the vent stream of a facility contains 90 percent negligibly reactive organic compounds and 10 percent reactive organic compounds, only 10 percent of the organic compounds emitted from that facility would be considered for calculating a TRE index. Although subtraction of

negligibly reactive compounds is permitted, it is expected that no significant change in national impacts will occur since very few air oxidation vent streams contain these compounds.

To allow for the subtraction of compounds with negligible photochemical reactivity in calculating a TRE index, several changes have been made in the regulation. The definition of TOC's in Section 60.611 has been amended as follows: "'TOC's means those compounds . . . . in Section 60.614. For the purposes of measuring molar composition as required in Section 60.614(d)(2)(i), hourly emissions rate as required in Section 60.614(d)(5) and 60.614(e), and TOC concentration as required in Section 60.615(b)(4) and 60.615(g)(4), those compounds that the Administrator has determined do not contribute appreciably to the formation of ozone are to be excluded. The compounds to be excluded are identified in EPA statements on ozone abatement policy for SIP revisions (42 FR 35314; 44 FR 32042; 45 FR 32424; 45 FR 48942)." These Federal Register notices are included in Appendix C of this document.

Even though subtraction of compounds with negligible photochemical reactivity is permitted in determining a TRE index value, the 98 weight-percent reduction requirement and 20 ppmv emission limits in the standards are based on the control of TOC's, minus methane and ethane. This is because the Agency evaluated BDT based upon the control of TOC's, not just reactive compounds. The Agency derived the weight percent emission reduction requirement and emission limit for air oxidation processes from data gathered using test procedures that measured TOC's, minus methane and ethane. No other VOC species, including compounds with negligible photochemical reactivity, were subtracted in evaluating BDT. Thus, to reflect accurately the performance of the technologies selected as BDT and to make the emission limits consistent with the data and test methods from which they were derived, the Agency will continue to express the emission limits in terms of TOC's, minus methane and ethane.

2.9 GENERAL

2.9.1 COMMENT: One commenter (D-6) requested better documentation of contacts between EPA and the Office of Management and Budget (OMB), especially in regard to the cost-effectiveness cutoff used in the proposed standards. To substantiate this request, the commenter cited Sierra Club v. Costle, 657 F.2d 298 (D.C. Cir. 1981), in which the court accepted the practice of reducing oral communications to memoranda and inserting them in the docket. This commenter also cited the CAA Section 307(d)(4)(B)(ii), which requires written communications to be placed in the public docket.

RESPONSE: All correspondence between EPA and OMB directly related to the proposed NSPS for SOCMI air oxidation processes is contained in Docket No. A-81-22, which is available for public inspection. The correspondence can be found under Docket Item Numbers II-C-24, II-F-1, and II-F-2. In addition, EPA has identified three pieces of correspondence between the Agency and OMB which discussed the development of a cost-effectiveness cutoff as part of the preparation of the CTG for air oxidation processes. These letters have been forwarded to the commenter and entered into Docket No. A-81-22, Category IV-C.

The policy of how any communication between EPA and another Federal agency should be treated by EPA has been clearly described in a letter from the Administrator to the commenter's organization (Docket Item No. IV-C-3).

APPENDIX A: TRE EQUATION AND COEFFICIENT DEVELOPMENT FOR THERMAL INCINERATORS

APPENDIX A: TRE EQUATION AND COEFFICIENT DEVELOPMENT FOR THERMAL INCINERATORS

A.1 INTRODUCTION

This appendix describes the development of the TRE index equations used in the proposed standards for air oxidation processes. These equations can be used to directly calculate the TRE index based on the vent stream flowrate (scm/min), heating value (MJ/scm), and VOC emission rate (kg/hr).

A.2 INCINERATOR TRE INDEX EQUATION

This section presents the method used to develop the incinerator TRE index equation and an example calculation of the incinerator TRE index.

A.2.1 Incinerator TRE Index Equation Development

The incinerator TRE index equation was developed in the following manner. First, an equation for total annualized cost was determined by combining the equations for each component of the annualized costs. The equations for each annualized cost component are shown in Docket Item No. IV-B-14 and include annualized capital costs, supplemental gas costs, labor costs, electricity costs, quench water costs, scrubber water costs, neutralization costs, and heat recovery credits.

The equation for total annualized costs developed from the equations for each annualized cost component (Docket Item No. IV-B-14) was divided by the amount of VOC removed and the reference cost effectiveness of $1,900/Mg of VOC removed to generate the general TRE index equation. Collecting like terms results in an equation with the following form:

$$TRE = \frac{1}{E_{TOC}} [a + b(Q_s)^{0.88} + c(Q_s) + d(Q_s)(H_T) + e(Q_s{}^{0.88})(H_T{}^{0.88}) + f(Y_s)^{0.5}]$$

where for a vent stream flowrate (scm/min) at a standard temperature of 20°C is greater than or equal to 14.2 scm/min:

TRE = TRE index value.

Q_s = Vent stream flowrate (scm/min), at a standard temperature of 20°C.

H_T = Vent stream net heating value (MJ/scm), where the net enthalpy per mole of vent stream is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20°C, as in the definition of Q_s.

E_{TOC} = Hourly emissions of TOC's reported in kg/hr measured at full operating flowrate.

Y_s = Q_s for all vent stream categories listed in Table A-1 except for Category E vent streams where $Y_s = (Q_s)(H_T)/3.6$.

where for a vent stream flowrate (scm/min) at a standard temperature of 20°C that is less than 14.2 scm/min:

TRE = TRE index value.

Q_s = 14.2 scm/min

$H_T = (FLOW)(H_{VAL})/14.2$

where:

FLOW = Vent stream flowrate (scm/min), at a temperature of 20°C.

H_{VAL} = Vent stream net heating value (MJ/scm), where the net enthalpy per mole of vent stream is based on combustion at 25°C and 760 mm Hg, but the standard temperature for determining the volume corresponding to one mole is 20°C, as in the definition of Q_s.

E_{TOC} = Hourly emissions of TOC's reported in kg/hr measured at full operating flowrate.

Y_s = Q_s for all vent stream categories listed in Table A-1 except for Category E vent streams where $Y_s = (Q_s)(H_T)/3.6$.

The coefficients a through f are functions of incinerator design parameters, such as temperature, residence time, supplemental fuel requirements, etc. As discussed in Chapter 8 of the Air Oxidation Processes

TABLE A-1. AIR OXIDATION NSPS TRE COEFFICIENTS FOR VENT STREAMS CONTROLLED BY AN INCINERATOR

DESIGN CATEGORY A1. FOR HALOGENATED PROCESS VENT STREAMS, IF 0 < NET HEATING VALUE (MJ/scm) < 3.5:

Q_s = Vent Stream Flowrate (scm/min)	a	b	c	d	e	f
$14.2 \leq Q_s \leq 18.8$	19.18370	0.27580	0.75762	-0.13064	0	0.01025
$18.8 < Q_s \leq 699$	20.00563	0.27580	0.30387	-0.13064	0	0.01025
$699 < Q_s \leq 1400$	39.87022	0.29973	0.30387	-0.13064	0	0.01449
$1400 < Q_s \leq 2100$	59.73481	0.31467	0.30387	-0.13064	0	0.01775
$2100 < Q_s \leq 2800$	79.59941	0.32572	0.30387	-0.13064	0	0.02049
$2800 < Q_s \leq 3500$	99.46400	0.33456	0.30387	-0.13064	0	0.02291

DESIGN CATEGORY A2. FOR HALOGENATED PROCESS VENT STREAMS, IF 3.5 < NET HEATING VALUE (MJ/scm):

Q_s = Vent Stream Flowrate (scm/min)	a	b	c	d	e	f
$14.2 \leq Q_s \leq 18.8$	18.84466	0.26742	-0.20044	0	0	0.01025
$18.8 < Q_s \leq 699$	19.66658	0.26742	-0.25332	0	0	0.01025
$699 < Q_s \leq 1400$	39.19213	0.29062	-0.25332	0	0	0.01449
$1400 < Q_s \leq 2100$	58.71768	0.30511	-0.25332	0	0	0.01775
$2100 < Q_s \leq 2800$	78.24323	0.31582	-0.25332	0	0	0.02049
$2800 < Q_s \leq 3500$	97.76879	0.32439	-0.25332	0	0	0.02291

DESIGN CATEGORY B. FOR NONHALOGENATED PROCESS VENT STREAMS, IF $0 \leq$ NET HEATING VALUE (MJ/scm) ≤ 0.48:

Q_s = Vent Stream Flowrate (scm/min)	a	b	c	d	e	f
$14.2 \leq Q_s \leq 1340$	8.54245	0.10555	0.09030	-0.17109	0	0.01025
$1340 < Q_s \leq 2690$	16.94386	0.11470	0.09030	-0.17109	0	0.01449
$2690 < Q_s \leq 4040$	25.34528	0.12042	0.09030	-0.17109	0	0.01775

DESIGN CATEGORY C. FOR NONHALOGENATED PROCESS VENT STREAMS, IF 0.48 < NET HEATING VALUE (MJ/scm) ≤ 1.9:

Q_s = Vent Stream Flowrate (scm/min)	a	b	c	d	e	f
$14.2 \leq Q_s \leq 1340$	9.25233	0.06105	0.31937	-0.16181	0	0.01025
$1340 < Q_s \leq 2690$	18.36363	0.06635	0.31937	-0.16181	0	0.01449
$2690 < Q_s \leq 4040$	27.47492	0.06965	0.31937	-0.16181	0	0.01775

DESIGN CATEGORY D. FOR NONHALOGENATED PROCESS VENT STREAMS, IF 1.9 < NET HEATING VALUE (MJ/scm) ≤ 3.6:

Q_s = Vent Stream Flowrate (scm/min)	a	b	c	d	e	f
$14.2 \leq Q_s \leq 1180$	6.67868	0.06943	0.02582	0	0	0.01025
$1180 < Q_s \leq 2370$	13.21633	0.07546	0.02582	0	0	0.01449
$2370 < Q_s \leq 3550$	19.75398	0.07922	0.02582	0	0	0.01775

DESIGN CATEGORY E. FOR NONHALOGENATED PROCESS VENT STREAMS, IF 3.6 < NET HEATING VALUE (MJ/scm):

Y_s = Dilution Flowrate (scm/min) = $(Q_s)(H_T)/3.6$	a	b	c	d	e	f
$14.2 \leq Y_s \leq 1180$	6.67868	0	0	0.00707	0.02220	0.01025
$1180 < Y_s \leq 2370$	13.21633	0	0	0.00707	0.02412	0.01449
$2370 < Y_s \leq 3550$	19.75398	0	0	0.00707	0.02533	0.01775

proposal BID, there are six different design categories of incinerators. Table A-2 presents the updated heating values and flowrate intervals associated with each category. Substituting the design values into the general equation allows values for coefficients a through f to be derived for each design category. This derivation is included in Docket Item No. IV-B-14.

The results of this derivation are summarized in Table A-1. As shown, the coefficients are divided into six incinerator design categories. Under each design category listed in Table A-1, there are several intervals of vent stream flowrate. Each flowrate interval is associated with a different set of coefficients. The first flowrate interval in each design category applies to vent streams with a flowrate corresponding to the smallest control equipment system easily available without special custom design.

The remaining flowrate intervals in each design category apply to vent streams which would be expected to use two, three, four, or five sets of control equipment, respectively. These flowrate intervals are distinguished from one another because of limits to prefabricated equipment sizes.

A.2.2 Example Calculation of an Incinerator-based TRE Index Value for a Facility

This section presents an example of use of the TRE index equation. The example reactor process vent stream has the following characteristics:

1. Q_s = 284 scm/min
2. H_T = 0.37 MJ/scm
3. E_{TOC} = 76.1 kg/hr.
4. Y_s = 284 scm/min.
5. No halogenated compounds in the vent stream.

Based on the stream heating value of 0.37 MJ/scm, Category B is the applicable incinerator design category for this stream. The flowrate is 284 scm/min, and therefore the coefficients for the first flowrate interval under Category B are used. The coefficients for Category B, flow interval #1 are:

TABLE A-2. MAXIMUM VENT STREAM FLOWRATES AND NET HEATING VALUE CHARACTERISTICS FOR EACH DESIGN CATEGORY

Category	Minimum Net Heating Value (MJ/scm)*	Maximum Net Heating Value (MJ/scm)*	Maximum Process Vent Stream Flowrate at Incinerator Inlet (10^3 scm/min)
A1	0	3.5	0.70
A2	3.5	-	0.70
B	0	0.48	1.34
C	0.48	1.9	1.34
D	1.9	3.6	1.18
E	3.6	-	1.18

*These values are based on process vent stream conditions.

$a = 8.54$

$b = 0.106$

$c = 0.090$

$d = -0.171$

$e = 0$

$f = 0.010$

The TRE equation is:

$$TRE = \frac{1}{E_{TOC}} [a + b(Q_s)^{0.88} + c(Q_s) + d(Q_s)(H_T) + e(Q_s{}^{0.88})(H_T{}^{0.88}) + f(Q_s)^{0.5}]$$

$$TRE = (.013)[8.54 + 0.106\ (284)^{0.88} + (0.090)(284)^{-0.171}$$

$$(284)(.37) + 0 + (0.010)(284)^{0.5}]$$

$$TRE = 0.111 + 0.199 + 0.332 - 0.236 + 0 + 0.002$$

$$TRE = 0.408$$

Since the calculated TRE index value of 0.408 is less than the cutoff value of 1.0, this facility would be required to reduce VOC emissions by 98 weight-percent or to 20 ppmv because the cost of incineration is considered to be reasonable. Because the TRE index is a ratio of two cost-effectiveness values, it is possible to calculate cost effectiveness for controlling any vent stream given its TRE index value. The TRE index value of the facility is multiplied by the reference cost effectiveness $1,900/Mg as follows:

TRE = 0.408

Reference cost effectiveness = $1,900/Mg

Cost effectiveness for example stream = (0.408)(1,900) = $775/Mg of VOC removed

APPENDIX B: CAPITAL COST COEFFICIENTS

APPENDIX B: CAPITAL COST COEFFICIENTS

One comment received after proposal of the standards noted a discrepancy concerning graphs in the proposal BID showing total installed capital costs. The data presented in these graphs were used to develop coefficients for the capital cost equation shown in Table 8-5 (proposal BID). As indicated in the response to public comments, the Agency has modified the cost equations to correct the small discrepancy noted by the commenter. A corrected copy of Table 8-5, which presents the capital cost coefficients used in the cost equation, is presented in Table B-1.

TABLE B-1. TOTAL INSTALLED CAPITAL COST EQUATIONS AS A FUNCTION OF OFFGAS FLOWRATE[29,30]

Category	Maximum Flowrate Per Unit (Thousand) (scm/min)	Fabricated Equipment Cost Escalation Factor	Design Vent Size Factor	C1	C2	C3
A1	0.74	.900	.95	803.11	12.83[a]	0.88
A2	0.79	.900	.95	786.61	12.44[a]	0.88
B	1.52	.900	.95	259.89	4.91	0.88
C	1.52	.900	.95	297.99	2.84	0.88
D	1.34	.900	.95	236.35	3.23	0.88
E[b]	1.34	.900	.95	236.35	3.23	0.88

Total Installed Capital Cost ($1,000) = (# of Units) x (Escalation Factor) x (C1 + C2 x ((Flowrate ($\frac{scm}{min}$) divided by Design Vent Size Factor)C3))[c]

[a] Flowrate Correction Factor of $1.12 = (1.14)^{.88}$ Incorporated into Coefficient C2.

[b] Dilution Flowrate is Used in Capital Cost Equation.
Dilution Flowrate = (Design Flowrate) x (Original Heating Value) divided by (3.6 MJ/scm).

[c] Flowrate per equipment unit.

APPENDIX C: FEDERAL REGISTER NOTICES OF ORGANIC COMPOUNDS DETERMINED TO HAVE NEGLIGIBLE PHOTOCHEMICAL REACTIVITY

APPENDIX C: FEDERAL REGISTER NOTICES OF ORGANIC COMPOUNDS DETERMINED TO HAVE NEGLIGIBLE PHOTOCHEMICAL REACTIVITY

INTRODUCTION

As indicated by the Federal Register notices included in this appendix, the following chemicals have been determined to be negligibly photochemically reactive compounds: methane; ethane; 1,1,1-trichloroethane; methylene chloride; trichlorofluoromethane; dichlorodifluoromethane; chlorodifluoromethane; trifluoromethane; trichlorotrifluoroethane; dichlorotetrafluoroethane; and chloropentafluoroethane.

ENVIRONMENTAL PROTECTION AGENCY

[FRL 720-6]

AIR QUALITY

Recommended Policy on Control of Volatile Organic Compounds

PURPOSE

The purpose of this notice is to recommend a policy for States to follow on the control of volatile organic compounds (VOC), which are a constituent in the formation of photochemical oxidants (smog). This notice does not place any requirements on States; State Implementation Plan (SIP) provisions which offer reasonable alternatives to this policy will be approvable. However, this policy will be followed by EPA whenever it is required to draft State Implementation Plans for the control of photochemical oxidants.

BACKGROUND

Photochemical oxidants result from sunlight acting on volatile organic compounds (VOC) and oxides of nitrogen. Some VOC, by their nature, start to form oxidant after only a short period of irradiation in the atmosphere. Other VOC may undergo irradiation for a longer period before they yield measurable oxidant.

In its guidance to States for the preparation, adoption, and submittal of State Implementation Plans published in 1971, the Environmental Protection Agency emphasized reduction of total organic compound emissions, rather than substitution. (See 40 CFR Part 51, Appendix B.) However, in Appendix B, EPA stated that substitution of one compound for another might be useful where it would result in a clearly evident decrease in reactivity and thus tend to reduce photochemical oxidant formation. Subsequently, many State Implementation Plans were promulgated with solvent substitution provisions similar to Rule 66 of the Los Angeles County Air Pollution Control District. These regulations allowed exemptions for many organic solvents which have now been shown to generate significant photochemical oxidant.

On January 29, 1976, EPA published its "Policy Statement on Use of the Concept of Photochemical Reactivity of Organic Compounds in State Implementation Plans for Oxidant Control." The notice of availability of this document appeared in the FEDERAL REGISTER on February 5, 1976 (41 FR 5350).

The 1976 policy statement emphasized that the reactivity concept was useful as an interim measure only, and would not be considered a reduction in organic emissions for purposes of estimating attainment of the ambient air quality standard for oxidants. The document also included the following statement:

> Although the substitution portions of Rule 66 and similar rules represent a workable and acceptable program at the present time, better substitution regulations can be developed, based on current knowledge of reactivity and industrial capability. EPA in collaboration with State and industry representatives will formulate in 1976 an improved rule for national use.

SUMMARY

Analysis of available data and information show that very few volatile organic compounds are of such low photochemical reactivity that they can be ignored in oxidant control programs. For this reason, EPA's recommended policy reiterates the need for positive reduction techniques (such as the reduction of volatile organic compounds in surface coatings, process changes, and the use of control equipment) rather than the substitution of compounds of low (slow) reactivity in the place of more highly (fast) reactive compounds. There are three reasons for this. First, many of the VOC that previously have been designated as having low reactivity are now known to be moderately or highly reactive in urban atmospheres. Second, even compounds that are presently known to have low reactivity can form appreciable amounts of oxidant under multiday stagnation conditions such as occur during summer in many areas. Third, some compounds of low or negligible reactivity may have other deleterious effects.

Of the small number of VOC which have only negligible photochemical reactivity, several (benzene, acetonitrile, chloroform, carbon tetrachloride, ethylene dichloride, ethylene dibromide, and methylene chloride) have been identified or implicated as being carcinogenic, mutagenic, or teratogenic. An additional compound, benzaldehyde, while producing no appreciable ozone, nevertheless, forms a strong eye irritant under irradiation. In view of these circumstances, it would be inappropriate for EPA to encourage or support increased utilization of these compounds. Therefore, they are not recommended for exclusion from control. Only the four compounds listed in Table 1 are recommended for exclusion from SIP regulations and, therefore, it is not necessary that they be inventoried or controlled. In determining reductions required to meet oxidant NAAQS, these VOC should not be included in the base line nor should reductions in their emission be credited toward achievement of the NAAQS.

It is recognized that the two halogenated compounds listed in Table 1 (methyl chloroform and Freon 113) may cause deterioration of the earth's ultraviolet radiation shield since they are nearly unreactive in the lower atmosphere and all contain appreciable fractions of chlorine. The Agency has reached conclusions on the effects of only the fully halogenated chlorofluoroalkanes. The Agency on May 13, 1977 (42 FR 24542), proposed rules under the Toxic Substances Control Act (TSCA) to prohibit the nonessential use of fully halogenated chlorofluoroalkanes as aerosol propellants. The restrictions were applied to all members of this class, including Freon 113 since they are potential substitutes for Freon 11, Freon 12, Freon 114, and Freon 115, which are currently used as aerosol propellants. The Agency is planning to investigate control systems and substitutes for nonpropellant uses under TSCA, as announced on May 13. Methyl chloroform is not a fully halogenated chlorofluoroalkane. Rather, it is among the chlorine-containing compounds for which the Agency has not completed its analysis: EPA has not yet concluded whether it is or is not a threat to the stratospheric ozone. Therefore, it has been placed on this list as an acceptable exempt compound. As new information becomes available on these compounds, EPA will reconsider the recommendation.

The volatile organic compounds listed in Table 2, while more photochemically reactive than those in Table 1, nevertheless do not contribute large quantities of oxidant under many atmospheric conditions.

TABLE 1.—*Volatile Organic Compounds of Negligible Photochemical Reactivity That Should Be Exempt From Regulation Under State Implementation Plans*

Methane
Ethane
1,1,1-Trichloroethane (Methyl Chloroform)[1]
Trichlorotrifluoroethane (Freon 113)[1]

[1] These compounds have been implicated as having deleterious effects on stratospheric ozone and, therefore, may be subject to future controls.

TABLE 2.—*Volatile Organic Compounds of Low Photochemical Reactivity*

Propane
Acetone
Methyl Ethyl Ketone
Methanol
Isopropanol
Methyl Benzoate
Tertiary Alkyl Alcohols
Methyl Acetate
Phenyl Acetate
Ethyl Amines
Acetylene
N, N-dimethyl formamide

Only during multiday stagnations do Table 2 VOC yield significant oxidants. Therefore, if resources are limited or if the sources are located in areas where prolonged atmospheric stagnations are uncommon, priority should be given to controlling more reactive VOC first and Table 2 organics later. Table 2 VOC are to be included in base line emission inventories and reductions in them will be credited toward achievement of the NAAQS. Reasonably available control technology should be applied to significant sources of Table 2 VOC where necessary to attain the NAAQS for oxidants. New sources of these compounds will also be subject to new source review requirements.

Perchloroethylene, the principal solvent employed in the dry cleaning industry, is also of low reactivity, comparable to VOC listed in Table 2. It was not included in Table 2 because of reported adverse health effects. Uses, environmental distribution, and effects of perchloroethylene currently are being studied intensively by occupational health authorities. Perchloroethylene currently are being studied in investigations may have major impact on

industrial users. In designing control regulations for perchloroethylene sources, particularly dry cleaners, consideration should be given to these findings as well as industry requirements and the cost of applying controls. Available control technology is highly cost effective for large perchloroethylene dry cleaning operations. However, for coin-operated and small dry cleaners, the same equipment would represent a heavy economic burden.

As part of its continuing program, EPA will review new information relative to the photochemical reactivity, toxicity, or effects on stratospheric ozone of volatile organic compounds. Where appropriate, additions or deletions will be made to the lists of VOC in Tables 1 and 2.

Discussion

Most air pollution control regulations applicable to stationary sources of VOC in the United States are patterned after Rule 66 of the Los Angeles County Air Pollution Control District (presently Regulation 443 of the Southern California Air Pollution Control District). Rule 66 and similar regulations incorporate two basic strategies to reduce ambient oxidant levels, *i.e.*, positive VOC reduction and selective solvent substitution based on photochemical reactivity. Positive reduction schemes such as incineration, absorption, and the use of low-solvent coatings are acknowledged means of reducing ambient oxidant levels; they should be retained in future VOC control programs. In contrast, the utility of solvent substitution strategies has been questioned as more information on photochemical reactivity has emerged.

EPA acknowledged the shortcomings of solvent substitution based on Rule 66 reactivity criteria in a 1976 policy statement (41 FR 3350). Findings were cited which indicated that almost all VOC eventually react in the atmosphere to form some oxidant. Concurrently, EPA initiated an investigation to consider implications of revising the solvent substitution aspects of Rule 66. Three separate forums were conducted with representatives of State and local air pollution control agencies, university professors, and industrial representatives with knowledge and expertise in the fields of tropospheric chemistry and industrial solvent applications. In addition, numerous discussions were held with acknowledged experts in the field. Topics of particular concern were:

Whether Rule 66 substitution criteria could be revised consistent with available reactivity data and yet be compatible with industrial processes and with product requirements.

Whether some compounds are of sufficiently low reactivity that they are not oxidant precursors and can be exempted from control under State Implementation Plans.

Whether the imposition of reactivity restrictions in addition to positive emission reductions will delay the development or implementation of promising technologies, particularly the use of water-borne and high-solids surface coatings.

Investigation showed that:

1. Solvent substitution based on Rule 66 has been directionally correct in the aggregate and probably effects some reductions in peak oxidant levels. However, because of the relatively high reactivity of most of the substituted solvents, the reduction is small compared to that which can be accomplished with positive reduction techniques. Revision of Rule 66 consistent with current knowledge of reactivity would eliminate the solvent substitution option for most sources in which substitution is now employed. Many of the organic solvents which have been categorized as having low photochemical reactivity are, in fact, moderately or highly reactive; they yield significant oxidant when subjected to irradiation in smog chambers designed to simulate the urban atmosphere.

2. A few VOC yield only negligible ozone when irradiated in smog chambers under both urban and rural conditions. Experiments conducted to date indicate that only methane and ethane, a group of halogenated paraffins, and three other organics—benzene, benzaldehyde, and acetonitrile—can be so classified. These compounds react very slowly yielding little ozone during the first few days following their release to the atmosphere. Available data suggest that none of the listed compounds contribute significant oxidant even during extended irradiation under multiday stagnation conditions.

The broad group "halogenated paraffins" includes important industrial solvents, most of which are chlorinated methanes and ethanes and chlorofluoroethanes. They find use as metal cleaning and dry cleaning solvents and as paint removers. Halogenated paraffins also serve as building blocks in the manufacture of other halogenated organics; these processes do not necessarily release significant VOC to the atmosphere.

3. Besides focusing on VOC of negligible reactivity, smog chamber studies show that a few additional VOC generate oxidant at a relatively slow rate. Under favorable atmospheric conditions, these VOC releases may not form oxidant until they have been transported substantial distances and become greatly diluted. However, under multiday stagnation conditions such as occur during summer in many areas of the middle and eastern United States, there is the potential for these organics to undergo appreciable conversion to oxidant. The more important VOC in this category are acetone, methyl ethyl ketone, perchloroethylene, methanol, isopropanol, and propane. All except propane are industrial solvents. The latter, a gas under normal conditions, is associated principally with crude oil and liquefied petroleum gas operations.

4. The vast number of volatile organic compounds—particularly nonhalogenated VOC—yield appreciable ozone when irradiated in the presence of oxides of nitrogen. While there are measurable variations in their rates of ozone formation, all are significantly more reactive than VOC listed in Table 2. Quickly reactive VOC include almost all aliphatic and aromatic solvents, alcohols, ketones, glycols, and ethers.

5. Low photochemical reactivity is not synonymous with low biological activity. Some of the negligible or slowly reactive compounds have adverse effects on human health. Benzene, acetonitrile, carbon tetrachloride, chloroform, perchloroethylene, ethylene dichloride, ethylene dibromide, and methylene chloride have been implicated as being carcinogens, teratogens, or mutagens. In addition, benzaldehyde, which produces no appreciable ozone, nevertheless forms a strong eye irritant under irradiation. While their use might reduce ambient oxidant levels, it would be unwise to encourage their uncontrolled release. Additional halogenated organics are being investigated for possible toxicity.

Most of the related health information available at this time concerns acute toxicity. Threshold limit values (TLV's) have been developed for many VOC. They are appropriate for the healthy, adult work force exposed eight hours a day, five days a week. Experts suggest that more stringent levels should be established for the general population. Hazards represented by chronic and subchronic exposure are much more difficult to quantify than acute toxicity. Adverse health effects of the VOC cited above are generally recognized although not completely quantified. Chlorinated solvents currently are under intensive study.

6. Some VOC are of such low photochemical reactivity that they persist in the atmosphere for several years, eventually migrating to the stratosphere where they are suspected of reacting and destroying ozone. Since stratospheric ozone is the principal absorber of ultraviolet (UV) light, the depletion could lead to an increase in UV penetration with a resultant worldwide increase in skin cancer. The only in-depth analysis of this potential problem has focused on the chlorofluoromethanes (CFM), Freon 11 and Freon 12, because of their known stability and widespread use in aerosol containers. A report of the National Academy of Sciences concerning environmental effects of CFM's concluded that:

> ". . . restrictive regulation of CFM uses and releases is almost certain to be necessary at some time and to some extent of completeness."

In response to the report of the National Academy of Sciences and other studies, EPA on May 13, 1977 (42 FR 24542), proposed rules to prohibit nonessential usage of fully halogenated chlorofluoroalkanes as aerosol propellants. The restrictions were applied to all members of this class including Freon 113 since they are potential substitutes for Freon 11, Freon 12, Freon 114, and Freon 115 which are currently used as aerosol propellants.

Other stable halogenated solvents which are released in volumes comparable to the chlorofluoroalkanes also are suspected of depleting the earth's UV shield. Of major concern is the wide-

spread substitution of methyl chloroform (1,1,1 trichloroethane) for the photochemically reactive degreasing solvent trichloroethylene. Such substitution under Rule 66 generation regulations has already influenced industrial degreasing operations to the extent that methyl chloroform production has surpassed that of trichloroethylene in the United States. Any regulation in the area will have a marked effect on the production and atmospheric emissions of both solvents. Endorsing methyl chloroform substitution would increase emissions, particularly in industrial States that have not, heretofore, implemented Rule 66. On the other hand, disallowing methyl chloroform as a substitute or banning it altogether would significantly increase emissions of trichloroethylene even if degreasers were controlled to the limits of available technology. Presently, technology is only able to reduce emissions by approximately 50 percent. In metropolitan areas which have already implemented Rule 66, a return to trichloroethylene would have an adverse effect on ambient ozone levels. In addition to being highly reactive, trichloroethylene has been implicated as a carcinogen.

Alternatives to the above-cited choices would be (1) development and application of highly efficient degreaser control systems and (2) replacement with an intermediate solvent which is neither reactive nor detrimental to the upper atmosphere. Major revisions would be needed to degreaser designs to improve vapor capture above the current best level. Anticipated design changes could add materially to degreaser costs. No alternative solvent is clearly acceptable from the standpoints of photochemical oxidant and stratospheric ozone depletion. Neither methylene chloride nor trichlorotrifluoroethane are reactive, but, like methyl chloroform, are suspected of causing damage to the stratospheric ozone layer. In addition, methylene chloride is a suspect mutagen. Perchloroethylene, the principal dry cleaning solvent, does not present a hazard to the stratosphere but has been implicated as being a carcinogen and also reacts slowly in the atmosphere to form oxidant.

7. Organic solvents of low or negligible photochemical reactivity have only limited use in many industries. Most are chlorinated organics that find principal applications as cleaners for metals and fabrics. A few nonhalogenated VOC such as acetone, methyl ethyl ketone, and isopropanol are of low reactivity but these can't possibly satisfy all the myriad needs of the paint, plastics, pharmaceutical, or many other industries. While users of reactive VOC usually can employ effective control equipment to recover or destroy VOC emissions, they seldom have the option of applying reactivity considerations in choosing solvents. Applying reactivity restrictions to the surface coating industry would be especially disadvantageous since it would greatly inhibit the development of low-solvent coatings; essentially all of the organic solvents used to constitute high-solids coatings and water-borne coatings are, in fact, highly reactive.

8. It is recognized that smog chamber studies conducted to date are incomplete because many organic compounds have not been examined and it has been impossible to duplicate all atmospheric situations. For example, there has been only limited examination of oxidant formation under relatively high ratios of VOC to NO_x (30:1 and greater), comparable to rural conditions. Any policy on photochemical reactivity necessarily has to be open to revision as new information is developed which may show specific organic compounds to be more or less photochemically reactive than indicated by current data.

Dated: June 29, 1977.

EDWARD F. TUERK,
Acting Assistant Administrator for Air and Waste Management.

[FR Doc.77-19040 Filed 7-5-77;8:45 am]

Review under 42 U.S.C. § 719(b) (1977 Supp.) from an order of the Secretary of Energy.

Copies of the petition for review have been served on the Secretary, Department of Energy, and all participants in prior proceedings before the Secretary.

Any person desiring to be heard with reference to such filing should on or before June 12, 1979, file a petition to intervene with the Federal Energy Regulatory Commission, 825 North Capitol Street, N.E., Washington, D.C. 20426, in accordance with the Commission's rules of practice and procedure (18 CFR 1.8). Any person wishing to become a party or to participate as a party must file a petition to intervene. Such petition must also be served on the parties of record in this proceeding and the Secretary of Energy through Gaynell C. Methvin, Deputy General Counsel for Enforcement and Litigation, Department of Energy, 12th and Pennsylvania Ave., N.W., Washington, D.C. 20461. Copies of the petition for review are on file with the Commission and are available for public inspection at Room 1000, 825 North Capitol St., N.E., Washington, D.C. 20426.

Kenneth F. Plumb,
Secretary.

[FR Doc. 79-17203 Filed 6-1-79; 8:45 am]
BILLING CODE 6450-01-M

[Docket No. RP79-98]

Triton Oil & Gas Corp.; Petition for Declaratory Order

May 23, 1979.

Take notice that on April 5, 1979, Triton Oil and Gas Corporation (Triton), One Energy Square, 4925 Greenville Avenue, Dallas, Texas 75206 filed in Docket No. RP79-98 a petition for declaratory order pursuant to Section 1.7 of the Commission's Rules of Practice and Procedure. Triton requests a determination that it has no refund obligation under Southern Louisiana Area Rate Opinion No. 699 for rates it collected for certain sales of gas. The gas is produced from four fields in the Southern Louisiana Area and sold to Tennessee Gas Pipeline Company, Texas Gas Transmission Company and Southern Natural Gas Company under Triton's Rate Schedules 1 and 5, 6, and 7 respectively.

On June 6, 1978, the Commission directed Triton, among other producers, to disburse refunds for the period from October 1968 to January 1971 pursuant to the Commission's Opinion Nos. 598 and 598-A or show cause why such refunds were not due. Triton's position is that because sales under these rate schedules were authorized by permanent certificates of public convenience and necessity which contained no refund conditions, there is no refund obligation. Triton acknowledges that the Commission may order refunds and reductions in rates after August 1, 1971—the effective date of Opinion No. 598. However, it asserts that the Commission is without authority to order such adjustments prior to the effective date where rates were not collected subject to a suspension order or under a temporary certificate.

Any person desiring to be heard or to make any protest with reference to said petition should file a petition to intervene or a protest with the Federal Energy Regulatory Commission, 825 North Capitol Street, N.E., Washington, D.C. 20426, in accordance with requirements of the Commission's rules of practice and procedure (18 C.F.R. 1.8 or 1.10). All such petitions or protests should be filed on or before June 20, 1979. All protests filed with the Commission will be considered by it in determining the appropriate action to be taken but will not serve to make the protestants parties to the proceeding. Any person wishing to become a party to a proceeding, or to participate as a party in any hearing therein, must file a petition to intervene in accordance with the Commission's rules.

Kenneth F. Plumb,
Secretary.

[FR Doc. 79-17202 Filed 6-1-79; 8:45 am]
BILLING CODE 6450-01-M

[Docket No. RP79-99]

United Gas Pipe Line Co.; Informal Settlement Conference

May 23, 1979.

Take notice that on June 7, 1979, at 2:00 p.m. an informal conference of all interested persons will be convened for the purpose of continued settlement discussions in this proceeding. The conference will be held in Room 3200 of the Federal Energy Regulatory Commission at 941 North Capitol Street, N.E., Washington, D.C. 20426.

Customers and other interested persons will be permitted to attend, but if such persons have not previously been permitted to intervene by order of the Commission, attendance will not be deemed to authorize intervention as a party in this proceeding.

All parties will be expected to come fully prepared to discuss the merits of the issues arising in this proceeding and to make commitments with respect to such issues and any offers of settlement or stipulation discussed at the conference.

Lois D. Cashell,
Acting Secretary.

[FR Doc. 79-17201 Filed 6-1-79; 8:45 am]
BILLING CODE 6450-01-M

Office of Energy Conservation and Solar Applications

Meeting Regarding Emergency Building Temperature Restrictions Program

Notice is hereby given that the Department of Energy (DOE) will hold a meeting with the National Governors' Association on Friday, June 8, 1979, at 11 a.m. in Room 285, 444 North Capitol Street, Washington, D.C.

The purpose of the meeting will be to discuss the role of the States in implementing the Emergency Building Temperature Restrictions Program. This program is authorized by the President's "Standby Conservation Plan No. 2: Emergency Building Temperature Restrictions," which recently was approved by the Congress.

Issued in Washington, D.C. on May 31, 1979.

Maxine Savitz,
Deputy Assistant Secretary, Conservation and Solar Applications.

[FR Doc. 79-17200 Filed 6-1-79; 12:45 pm]
BILLING CODE 6450-01-M

ENVIRONMENTAL PROTECTION AGENCY

[FRL 1228-6]

Air Quality; Clarification of Agency Policy Concerning Ozone SIP Revisions and Solvent Reactivities

ACTION: This notice is published under the authority of section 101(b) and section 108 of the Clean Air Act. The notice clarifies EPA's "Recommended Policy on Control of Volatile Organic Compounds," 42 FR 35314 (July 8, 1977).

STATEMENT: The July 1977 Policy Statement noted that only reactive volatile organic compounds participate in the chemical reactions that form photochemical oxidants. Currently available information suggests that negligibly photochemically reactive volatile organic compounds as defined in that Statement, including methyl

chloroform and methylene chloride, do not appreciably affect ambient ozone levels. Hence, EPA will not disapprove any state implementation plan or plan revision for its failure to contain regulations restricting emissions of these compounds.

Although these substances need not be controlled under state implementation plans for the purpose of achieving ambient ozone standards, nothing in this memorandum is intended to modify past EPA expressions of concern about the uncontrolled use of methyl chloroform and methylene chloride. As noted in the above referenced policy and the clarification presented in memoranda of August 24, 1978 and March 8, 1978, there is suggestive evidence that both compounds are potentially carcinogenic and methyl chloroform is suspected of contributing to depletion of stratospheric ozone. See, for example, the following studies:

Simmon, V. F., Kauhanen, K. and Tardiff, R. G., "Mutagenic Activity of Chemicals Identified in Drinking Water" in *Progress in Genetic Toxicology*, ed. I. D. Scott, B. A. Bridges, and F. H. Sobels, at 249–258 (Elsevier, 1977);

Price, P. G., Hassett, C. M. and Mansfield, O. L., "Transforming Activities of Trichloroethylene and Proposed Industrial Alternatives" *In Vitro* 14:3, at 290–293 (1978);

Theiss, J. C., Stoner, G. D., Shimkin, M. B., *et al.*, "Test for Carcinogenicity of Organic Contaminants of United States Drinking Waters by Pulmonary Tumor Response in Strain A Mice," *Cancer Research*, 37[8 Pt. 1]: 2717–20, (August 1977);

The EPA Carcinogen Assessment Group's Preliminary Risk Assessment on Methyl Chloroform, Type I—Air Program, (January 17, 1979);

The EPA Carcinogen Assessment Group's Preliminary Risk Assessment on Methylene Chloride, Type I—Air Program, (January 17, 1979);

Conference on Methyl Chloroform and other Halocarbon Pollutants, sponsored by Environmental Sciences Research Laboratory, U.S. EPA, February 27–28, 1978; Washington, D.C. (proceedings in press).

Because both methyl chloroform and methylene chloride are potentially harmful, EPA recommends that these chemicals not be substituted for other solvents in efforts to reduce ozone concentrations. EPA further recommends that the states control these compounds under the authority reserved to them in section 116 of the Clean Air Act. Moreover, there is a strong possibility for future regulation of these compounds under the Clean Air Act.

FOR FURTHER INFORMATION CONTACT:
Joseph Padgett, Director, Strategies and Air Standards Division, Office of Air Quality Planning and Standards, MD–12 Research Triangle Park, North Carolina 27711 (919) 541–5204.

Dated: May 25, 1979.

David G. Hawkins,

Assistant Administrator for Air, Noise and Radiation.

[FR Doc. 79-17304 Filed 6-1-79; 8:45 am]

BILLING CODE 6560-01-M

[FRL 1238-8]

Region II; Groundwater System of the New Jersey Coastal Plains Aquifer

On March 21, 1979, a notice was published stating that a petition has been submitted by the Environmental Defense Fund, Inc. and the Sierra Club-New Jersey Chapter, pursuant to Section 1424(e) of the Safe Drinking Water Act, Pub. L. 93–523, requesting the Administrator of the Environmental Protection Agency to make a determination that the aquifer underlying the Counties of Monmouth, Burlington, Ocean, Camden, Gloucester, Atlantic, Salem, Cumberland and Cape May and portions of Mercer and Middlesex Counties, New Jersey is the sole or principal drinking water source for the coastal plain area which, if contaminated, would create a significant hazard to public health.

The notice indicated that comments, data and references in response to the petition should be submitted by May 21, 1979. Due to the complexity of issues which surround the designation of the Coastal Plain Area as a sole source aquifer, EPA was requested to extend the comment period. In order to permit sufficient time for all interested individuals to provide their input, EPA will extend the comment period on this petition request from May 21, 1979 to August 20, 1979. Comments, data and references in response to the Coastal Plain Petition should be submitted in writing to Eckardt C. Beck, Regional Administrator, Region II, Environmental Protection Agency, 26 Federal Plaza, Room 1009, New York, N.Y. 10007, Attention: Coastal Plain Aquifer. Information concerning the Coastal Plain Aquifer System will be available for inspection at the above address.

Dated: May 21, 1979.

Eckardt C. Beck,

Regional Administrator.

[FR Doc. 79-17305 Filed 6-1-79; 8:45 am]

BILLING CODE 6560-01-M

[FRL 1239-3 OPP-60098]

State-FIFRA Issues Research and Evaluation Group (SFIREG); Working Committee on Enforcement; Open Meeting

AGENCY: Environmental Protection Agency (EPA), Office of Pesticide Programs.

ACTION: Notice of Open Meeting.

SUMMARY: There will be a two-day meeting of the Working Committee on Enforcement of the State-FIFRA Issues Research and Evaluation Group (SFIREG) on Tuesday and Wednesday, June 5–6, 1979, beginning at 8:30 a.m. each day, and concluding by 12 noon on June 6th. The meeting will be held at the Atlanta Town House, 100 Tenth Street, N.W., Atlanta, Georgia. Telephone: 404/892-6800, and will be open to the public.

FOR FURTHER INFORMATION CONTACT:
Mr. William Buffaloe, North Carolina Department of Agriculture, Raleigh, North Carolina, Telephone: 919/733-3556; or Mr. Anthony Dellavecchia, Pesticide and Toxic Substances Enforcement Division, EPA, 401 M Street, S.W., Washington, D.C., telephone: 202/755-0014.

SUPPLEMENTARY INFORMATION: This the second meeting of the Working Committee on Enforcement. The meeting will be concerned with the following topics:

1. Plan for future recall and suspension orders;
2. Clarification of undefined terms in Section 23 and 27 of FIFRA;
3. Status of State primacy use enforcement notice;
4. Use of recommendations of agricultural extension publications by pesticide sales representatives;
5. Discussion of definition of "non crop land;"
6. FIFRA Section 7—producers of active ingredients; and
7. Other enforcement matters which may arise.

Dated: May 25, 1979.

Edwin L. Johnson,

Deputy Assistant Administrator for Pesticide Programs.

[FR Doc. 79-17306 Filed 6-1-79; 8:45 am]

BILLING CODE 6560-01-M

Included within the definition of nontarget sites are areas of permanent human habitation including permanent residences, schools, churches, and areas in which substantial commercial activities are conducted (e.g., shopping centers), domestic apiaries, and publicly-maintained roads. In addition, aquatic habitats such as critical fisheries, municipal water supply intakes and other waters (which include rivers, streams, ponds, lakes, and ephemeral streams and ponds with flowing or standing water visible from an aircraft flying at an altitude of 1,000 feet above the terrain at the time of treatment), are included within the definition of a sensitive area. The release of any pesticide spray is not permitted over a sensitive area or in the surrounding buffer zone. Buffer zones are defined as areas intended to receive only spray drift fallout from the application sites.

The Agency recognizes that some seasonal dwellings, such as hunting and fishing camps, may be located in or adjacent to the treatment area. These dwellings are not considered to be permanent residences and thus will not be buffered against direct application. However, many of these dwellings are near aquatic sites listed in Table II which will be buffered.

To minimize operational errors, overflights of the treatment area prior to the actual spray operation are encouraged. The purpose of these overflights is to locate visually all sensitive areas and buffer zones designated on the spray block maps. Particular attention should be given to identifying ephemeral streams and ponds visible from an aircraft flying at an altitude of 1,000 feet or less above the terrain at the time of treatment, which may not be designated on the spray block map due to their seasonality.

Authority

This Advisory Opinion governing the use of certain insecticides for the suppression of the spruce budworm in Maine through July, 1980, is issued pursuant to the authority granted to the Administrator by Section 2(ee) of FIFRA, 7 U.S.C. 136(ee) (Supp. 1979). Section 12(a)(2)(G) of FIFRA makes it unlawful for any person "to use any registered pesticide in a manner inconsistent with its labeling." Section 2(ee) defines this terminology as prohibiting the use of registered pesticide "in a manner not permitted by the labeling." However, section 2(ee) also provides that this prohibition does not apply with respect to "any use of a pesticide in a manner that the Administrator determines to be consistent with the purposes of this Act."

Effective Date: This Notice is effective through July 31, 1980.

Dated: May 5, 1980.

Steven D. Jellinek,

Assistant Administrator for Pesticides and Toxic Substances.

[FR Doc. 80-14537 Filed 5-15-80; 8:45 am]

BILLING CODE 6560-01-M

[FRL 1483-7]

Air Quality; Clarification of Agency Policy Concerning Ozone SIP Revisions and Solvent Reactivities

BACKGROUND: This notice is published under the authority of § 101(b) and § 103 of the Clean Air Act. The notice provides further clarification of a policy announced in EPA's "Recommended Policy on the Control of Volatile Organic Compounds," 42 FR 35314 (July 8, 1977) and "Clarification of Agency Policy Concerning Ozone SIP Revisions and Solvent Reactivities," 44 FR 32042 (June 4, 1979).

DISCUSSION: The previous policy statements on the control of volatile organic compounds (VOC's) noted that methyl chloroform and methylene chloride are negligibly photochemically reactive and do not appreciably contribute to the formation of ozone. Consequently, controls on emissions of these two compound would not contribute to the attainment and maintenance of the national ambient air quality standards for ozone. In the June 1979 policy statement EPA explained that it would not disapprove any state implementation plan (SIP) or plan revision for its failure to contain regulations restricting emissions of methyl chloroform and/or methylene chloride.

Today's statement clarifies EPA policy regarding state implementation plan submittals which do contain regulations restricting emissions of the two compounds. Section 110(a)(1) of the Clean Air Act limits state implementation plans to measures designed to achieve and maintain the national ambient air quality standards (NAAQS). Because current information indicates that emissions of methyl chloroform and methylene chloride do not appreciably affect ambient ozone levels, EPA cannot approve measures specifically controlling emissions of either or both compounds as part of a federally enforceable ozone SIP. EPA will take no action on any measures specifically controlling emissions of the two compounds which are submitted by the states as ozone SIP measures for EPA approval. If a state chooses to control emissions of these compounds, such measures will be considered as state regulations only and not as part of an ozone SIP. EPA will not enforce controls on emissions of either methyl chloroform or methylene chloride adopted by the state as part of an implementation plan for ozone.

States retain authority to control emissions of these compounds under the authority reserved to them under Section 116 of the Clean Air Act. For further information relevant to the exercise of this authority see the July 8, 1977 and June 4, 1979 policy statements. This policy notice should not be read as a statement of EPA's views on the desirability of controls on these substances.

Finally, EPA wishes to point out that this policy notice addresses only the Agency's lack of authority to include in federally approved SIPs controls on substances whose emissions do not contribute, either directly or indirectly, to concentrations of pollutants for which NAAQS have been established under section 109 of the Act. This policy notice does not address the question of SIP measures which control substances contributing to concentrations of pollutants for which NAAQS have been established, but which are contended to be more strict than absolutely necessary to attain and maintain the NAAQS. EPA has no authority to exclude such measures from SIPs.

FOR FURTHER INFORMATION CONTACT: G. T. Helms, Chief, Control Programs Operations Branch (MD-15), Research Triangle Park, North Carolina 27711, (919) 541-5226, FTS 629-5226.

Dated: May 9, 1980.

David G. Hawkins,

Assistant Administrator for Air, Noise and Radiation.

[FR Doc. 80-14538 Filed 5-15-80; 8:45 am]

BILLING CODE 6560-01-M

[FRL 1481-7; PP 9G1807/T239]

Extension of a Temporary Tolerance

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice.

SUMMARY: EPA has extended the temporary tolerance for residues of the herbicide thidiazuron (*N*-phenyl-*N'*-1,2,3-thiadiazol-5-ylurea) and its aniline-containing metabolites in or on the raw agricultural commodities cottonseed at 0.2 part per million (ppm), milk 0.05 ppm, eggs 0.1 ppm, meat fat and meat byproducts of cattle, goats, hogs, horses, poultry, and sheep at 0.2 ppm.

TECHNICAL REPORT DATA (Please read Instructions on the reverse before completing)		
1. REPORT NO. EPA-450/3-82-001b	2.	3. RECIPIENT'S ACCESSION NO.
4. TITLE AND SUBTITLE Air Oxidation Processes in Synthetic Organic Chemical Manufacturing - Background Information for Final Standards		5. REPORT DATE June 1990
		6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S)		8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS Office of Air Quality Planning and Standards U. S. Environmental Protection Agency Research Triangle Park, North Carolina 27711		10. PROGRAM ELEMENT NO.
		11. CONTRACT/GRANT NO. 68-02-3058
12. SPONSORING AGENCY NAME AND ADDRESS Director for the Office of Air Quality Planning and Standards Office of Air and Radiation, U. S. EPA Research Triangle Park, North Carolina 27711		13. TYPE OF REPORT AND PERIOD COVERED
		14. SPONSORING AGENCY CODE EPA/200/04
15. SUPPLEMENTARY NOTES This document presents the background information used by the Environmental Protection Agency in developing the final new source performance standards for emissions of volatile organic compounds from air oxidation processes in the synthetic organic chemical manufacturing industry.		

16. ABSTRACT

Standards of performance for the control of volatile organic compound (VOC) emissions from air oxidation processes in the synthetic organic chemical manufacturing industry are being promulgated under Section 111 of the Clean Air Act. These standards will apply to VOC emissions from newly constructed, modified, and reconstructed air oxidation processes. This document summarizes the responses to public comments received on the proposed standards and the basis for changes made since proposal.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air pollution Air oxidation processes Pollution control Standards of performance Organic chemical industry Volatile organic compounds (VOC)	Air Pollution Control	
18. DISTRIBUTION STATEMENT Unlimited - available to the public free of charge from U. S. EPA Library (MD-35) Research Triangle Park, N. C. 27711	19. SECURITY CLASS (This Report) Unclassified	21. NO. OF PAGES 81
	20. SECURITY CLASS (This page) Unclassified	22. PRICE

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